5. セミナーに使用した講師のテキスト "Revised"

Specific Features of Japanese Fisheries

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Introduction

During the past two decades Japanese fishery achieved a marked structural improvement. Despite a high level of her fishery production Japan is still in need of supplementing quality fish through both the import of fishery products and marine-ranching.

Japan is known to many other nations as the world largest fish producing country with a large distant water fishing fleet. It is true that in the past her long distant water fishery often exploited fishery resources off other countries, which are now under the jurisdiction of respective coastal countries with the declaration of their exclusive economic zone (EEZ). This fact has mislead, however, to many foreigners as if a long distant water fishery is the mainstay of Japanese fishery. In the present article, attempt is, therefore, made to eliminate such a misunderstanding by illustrating how her coastal and off-shore fisheries have played the utmost important role in her fishing industry as a whole.

Attempt is also made herein to show how the preference of Japanese people to fish and fishery products has now been changed into more quality fish in relation to a marked increase in per capita income and consequently an enormous increase in the import of fishery products.

Japan's Fishery Production still Remains at a Very High Level Even Under the New Regime of Sea

During a period from 1960 to 1984 Japan's total fishery production increased by 100 percent from 6.2 million ton to nearly 13 million metric tons with

an annual increasing rate of 3.4 percent. An increasing trend of her fishery was particularly high in the 1960s with an annual rate of 4.1 percent due mainly to the remarkable development of her distant water fishery. The increasing rate, however, slowed down in late 1970s due to a decline of fishery production from the distant water fishery,as it was greatly affected by 200 miles economic zones declared by many coastal countries. Nevertheless, Japan's fishery production level was still able to keep an upward trend with a tremendous increase of catch realized by the off-shore fishery and a steady increase of catch and yield from the coastal fishery. This is attributed mainly to a great recovery in sardine resources around Japan which occured after 1976 and partly to a steady increase in mari-culture yields which began in around 1970. (See Fig. 1)

In Japan the production from inland fishery is insignificant, being less than 2 percent of the total fishery production in 1984. Analysis hereunder is, therefore, made mainly for marine fishery.

(Note) For the definition of coastal, off-shore and distant water fisheries please see the notes given Fig. 1.

Coastal Fishery is the Mainstay of Japanese Fishery

It should be noted that the majority of fishing establishments in Japan are fishing households which engage in coastal fishery, while those which engage in off-shore fishery and distant water fishery are a few in number. In 1984 there were some 205 thousand fishing establishments throughout the country, of which 195 thousand or 94 percent were fishing households. Thus, the number of fishing establishments that engaged in off-shore and distant water fisheries was only 11 thousand or 6 percent of the total. The coastal fishery in Japan is equivalent to so-called "Small scale fishery" in developing countries. There is a clear declining trend in the number of fishing households as seen in Fig. 2 , while there is a gradual increasing trend in the production from coastal fishery as seen in Fig.1. This may well imply that in general income per fishing household is being improved.

(Note) For the definition of "fishing establishment" please see the notes as given in Fig. 2.

Marked Technical Renovation which Occured for Small Fishing Boats

During the past two decades there has been a tremendous improvement in the quality of Japanese fishing fleet, which particularly occured for powered boat of less than 10 gross tons. During this period quite many of non-powered boats were replaced with powered boat with either out-board or in-board engine. Such a great progress of mechanization for small fishing boats was made to raise fishing efficiency as well as to reduce the number of fishermen aboard the boat in response to the great shortage of fishing labor force which occured after 1960. Besides, the majority of wooden made small boats which had been traditionally used for many centuries have now been replaced with fibre reinforced plastic boats. Thus, nowadays wooden fishing boats can be hardly seen in Japan. (See Fig. 3)

Improvement of Fishermen's Labor Productivity in Relation to Tremendous Decrease in the Number of Fishermen

In around 1960 it was keenly felt that in order to improve the productivity of fishermen the number of fishermen should be reduced, so that their income could be raised and become comparable with that of workers in urban area. It was fortunate that during the past two decades Japanese national econòmy achieved a great progress creating more jobs in urban area, which encouraged many youth in rural area to move into urban area. As a result, during a period from 1960 to 1983 the number of fishermen decreased by 38 percent from 723 thousand to 446 thousand with an annual decreasing rate of 2.3 percent. As a matter of fact, in recent years one of the greatest difficulties encountered by Japanese fishing industry has been to locate the youth who are willing to join fishery. (See Fig. 4)

Quality Fish Are Mainly Produced by Coastal Fishery

An importance of coastal fishery in comparison with off-shore fishery can be clearly noted when the production is assessed in terms of value, as the former produces mainly quality fish. In volume terms coastal fishery produces only 26.3 percent of the total, while in value terms it represents 43.3 percent of the total. This is due to the fact that speices caught by coastal fishery are mainly high valued fish such as sea breams, yellowtail, sea perch, "Kuruma" prawn, abalone, etc. It is also worthwhile to note that mari-culture which has

now become the mainstay of coastal fishery also produces quality fish such as yellowtail, sea bream, horse mackerel, shrimp, oyster, scallop, sea lavor, etc. On the contrary, although in volume terms off-shore fishery produces 54.2 percent of the total catch, in value terms it represents only 26.8 percent of the total. (See Fig. 5)

Distant Water and Off-shore Fisheries Produce Mainly Low Quality Fish

Japanese fishery produces a variety of fish, which are caught or cultured. However, speccies which are abundantly caught are pilchard (sardine), Alaska pollack, mackerel, squids, skipjack and tuna. Catch of these six species alone represents 63 percent of the totel production. Surprisingly, catch of pilchard alone ocuppies more than a third of Japan's total fishery production. These fish are mostly caught by either distant water or off-shore fishery. With the exception of tunas none of these fish are quality fish. (See Fig. 6)

Fish Which Are Abundantly Caught Are Mostly Processed

Almost all of pilchard catch, probably more than 90 percent, is disposed either as raw materials for fish meal and fish oil or as feed for mari-culture, as the demand of this fish for human consumption and canning is very limited. Mackerel is used as a table fish when it is large in size. However, when it is small in size, it is also disposed for reduction or mari-culture. The catch of Alaska pollack is almost fully processed into "Surimi", which is the major raw material for fish paste (Kamaboko). Part of mackerel and tuna catch is disposed for canning mainly for export. Skipjack catch is mostly disposed for so-called "Fushi". However, when it was abundantly caught by Skipjack/tuna purse seine, it is exported to Thailand for canning. In those days curing in Japan is not necessarily confined to simply dried or salted fish. A variety of new fish processed products which will meet the preference of consummers are now being developed. (See Fig. 7)

In Recent Years Fish Consumption Has Become Stagnant

For many centuries fish have been the major source of animal protein for Japanese. For the past two decades, however, there has been a very little increase in fish consumption, while that of meats and livestock products has increased considerably. (See Fig. 8) The main reason is that fish is not always easy

to cook at home because of its bone, and young people prefer meat to fish. Another reason seems to be a marked rise in the price of fish in comparison with that of livestock products. For a period from 1975 to 1981 the consumer's price index number of fresh fish went up by nearly 60 percent as against 18 percent for meat. (See Fig. 9) Nevertheless, preference of Japanese consumers to fish which has been firmly established for many centuries should not be understated by looking at the volume of fish taken alone, as Japanese are now inclined to take either better quality fish or new types of fish processed products which are more prefered by them. Crab substitute which is made of "Surimi" and is called "Kani-kamaboko" is a good example for the latter.

Japan is Now World Leading Fish Importing Country

Before the World War II Japan was a fish exporting country, but she has now become the world leading fish importing country. Import of fishery products to Japan began to increase particularly after 1971, and the import value has now far exceeded to the export value. Thus, by 1984 Japan has shared slightly over a quarter of the world total import of fishery products. (See Fig. 10 and 11) Major fishery product being imported to Japan are shrimp, crab, cephlopode (squid, cuttlefish and octopus), tunas, salmon and roe of salmon and herring, all of which are quality fish or quality fishery products. These facts may well reveal that Japanese fishery is not always capable of supplying the sufficient quantity of quality fish to meet the demand of her consumers.

In Recent Years There Appeared Some Increase in the Export of Fishery Products

Since 1980 there has been a slight increase in the export of Japanese fishery products. This is due to an increase in the export of fish oil to Holland and frozen skipjack to Thailand.

Fishery Economy at A Glance

(1) Income as well as Living conditions of Fishing Households is Healthy

In Japan a fishing household is defined as a household that engages in own fishing with the family member of the fishing household. It performs a fishery for the purpose of maintaining their livelihood. Thus, in definition, the fishing household in Japan is more or less equivalent to the fishing households,

which engage in small scale fishery in developing countries.

An income of the fishing household is composed of, as seen in Fig. 13.1, not only that from capture or mari-culture but also that from salary and wage originated from jobs other than fishery and that from own account buisiness other than fishery like own farming, fish processing, fish trade, etc. Average annual income per fishing household throughout all types and all sizes of fishing household in 1984 was slightly over US$ 20 thousand. However, average income of fishing household engaged in capture fishery was slightly lower than the above overall average, being US$ 18 thousand. On the contrary, average income of fishing household engaged in mari-culture was much higher than the overall average, being US$ 28 thousand. These incomes seems to be sufficient enough to sustain their livelihood. As seen in Fig. 13.2, even after deducting both household expenditure and taxes from these incomes, the fishing household still finds a good amount of surpluses, which are US$ 2.5 thousand for capture fishing household and US$ 5 thousand for mari-culture household.

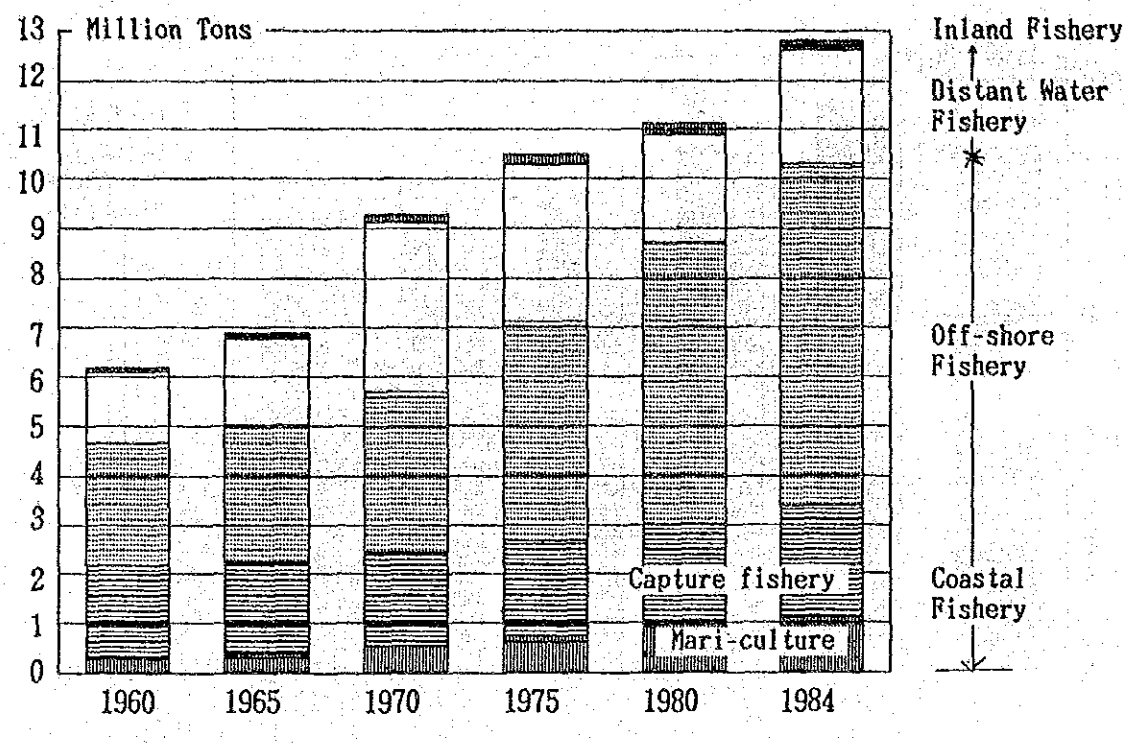
(2) The Business of Industrial Fisheries is generally in the Red.

In Japan an industrial fishery is defined as a fishery which use a fishing boat of 10 gross ton and above and is undertaken with hired fishermen. The objective of undertaking the industrial fishery is to pursue a profit. As seen in Table 1, in those days an average total cost including imputed wages for the family members of the operator always slightly exceeds an average total sale of catch. Thus, Since 1980 the industrial fisheries have been generally suffered from a deficit operation. This is due mainly to the high price of fuel.

Development of Marine-ranching to Raise the Productivity of Marine Resources

Last of all it may be worthwhile to refer to "Marine-ranching", which is now enthusiastically being promoted by the goverment. In the marine-ranching sea is considered as something like farmland, for which a large amount of fish seeds which are mostly artificially bred are stocked to raise the productivity of fisheries resources. By 1982 the number of fish seeds centers, i.e. hatcheries, which have been constructed by the goverment accounts for 49 throughout the country. Species for which fish seeds are now being produced are mainly sea bream, "Kuruma" prawn, swimming crab, abalone, etc., but there are also many other species for which artificial breeding technique has been developed.

Fig. 1 Japan's Fishery Production By Subsectors, 1960-1984



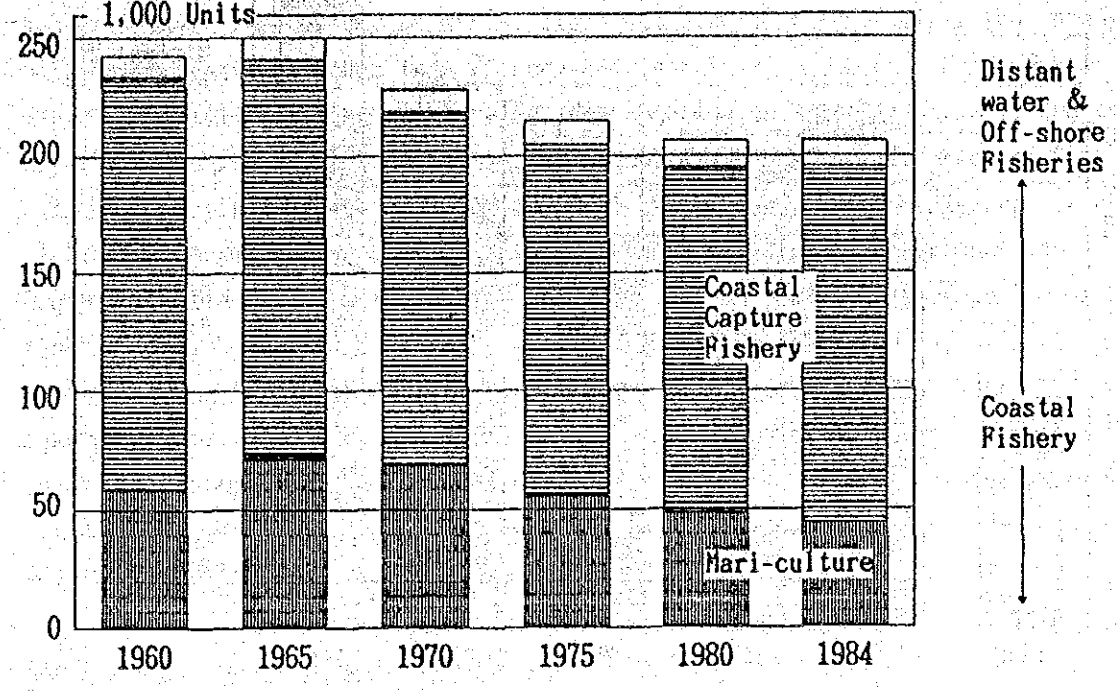
(Note) 1. Coastal fishery is the fishery operating in sea areas located in 2 to 3 kilometer from the sea-shore of Japan with the use of less than 10 gross tons of boats. Coastal fishery is composed of coastal capture fishery and mari-culture.

2. Off-shore fishery is the fishery operating in sea areas beyond the sea areas used by the coastal fishery but within the EEZ of Japan with the use of more than 10 gross tons of boats.

3. Distant water fishery is the fishery operating in high seaa and the EEZ of other coastal countries.

(Source) Japanese fishery statistics.

Fig. 2 Structual Change of Marine Fishery in Japan, 1960-1984
-Change in Number of Fishing Establishments by Sizes of Fishery Management-

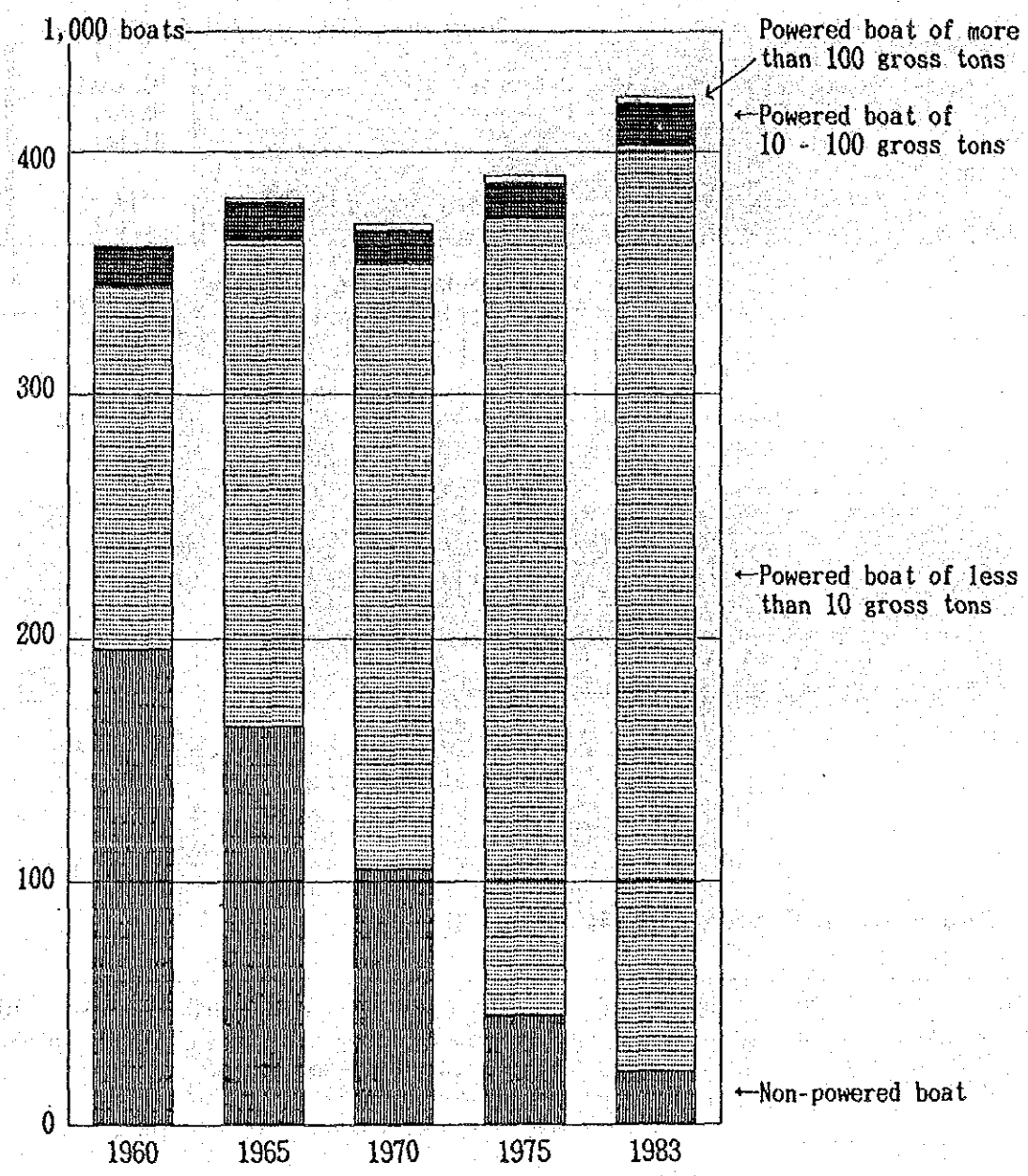


(Note) i. Fishing establishment is an economic unit, which engage in fishery regardless of the size of fishery employed.

ii. In Japan fishing households are the main component of her marine fishing establishments, which mainly engage in coastal fishery. The fishing households engage in their own fishery with their family members, and the purpose of their fishery is to maintain their livelihood with daily little income through their coastal fishery. Fish-households in Japan are more or less equivalent to small scale fishermen in many developing countries.

iii. Fishing establishments which engage in distant water and off-shore fisheries are mostly fishery entrepreneurs who are either individual propriators or companies. They perform their fisheries with hired fishermen, and the purpose of their fishery is to pursue a profit. Those who engage in off-shore and distant water fisheries are more or less equivalent to commercial fishermen in many other countries.

Fig. 3 Number of Fishing Boats by Sizes, 1960-1983



(Note) The number of powered boats of more than 100 gross tons in 1983 was a very few, being only 3,222. That of powered boats of 10 - 100 gross ton in the same year was around 13,000. Yet it is far fewer than that of powered boats of less than 10 gross ton.

Fig. 5 Relative Importance of Major Fisheries in Terms of Catch, 1984

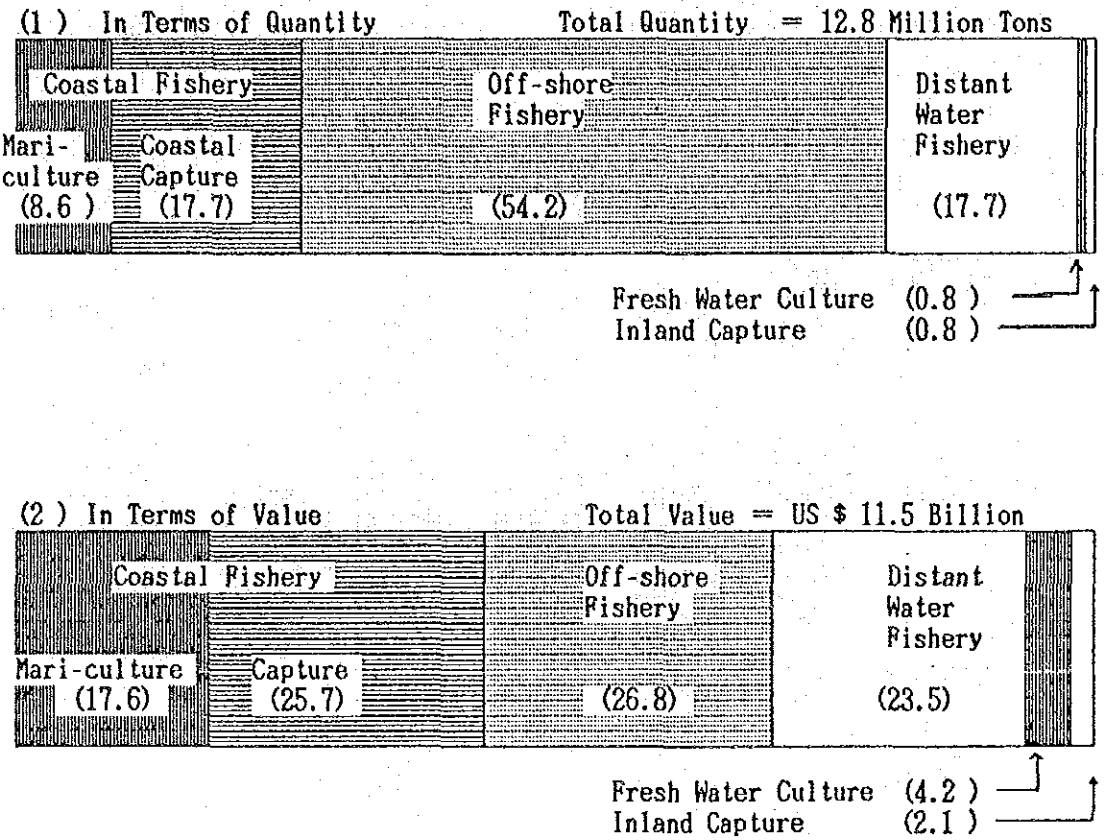
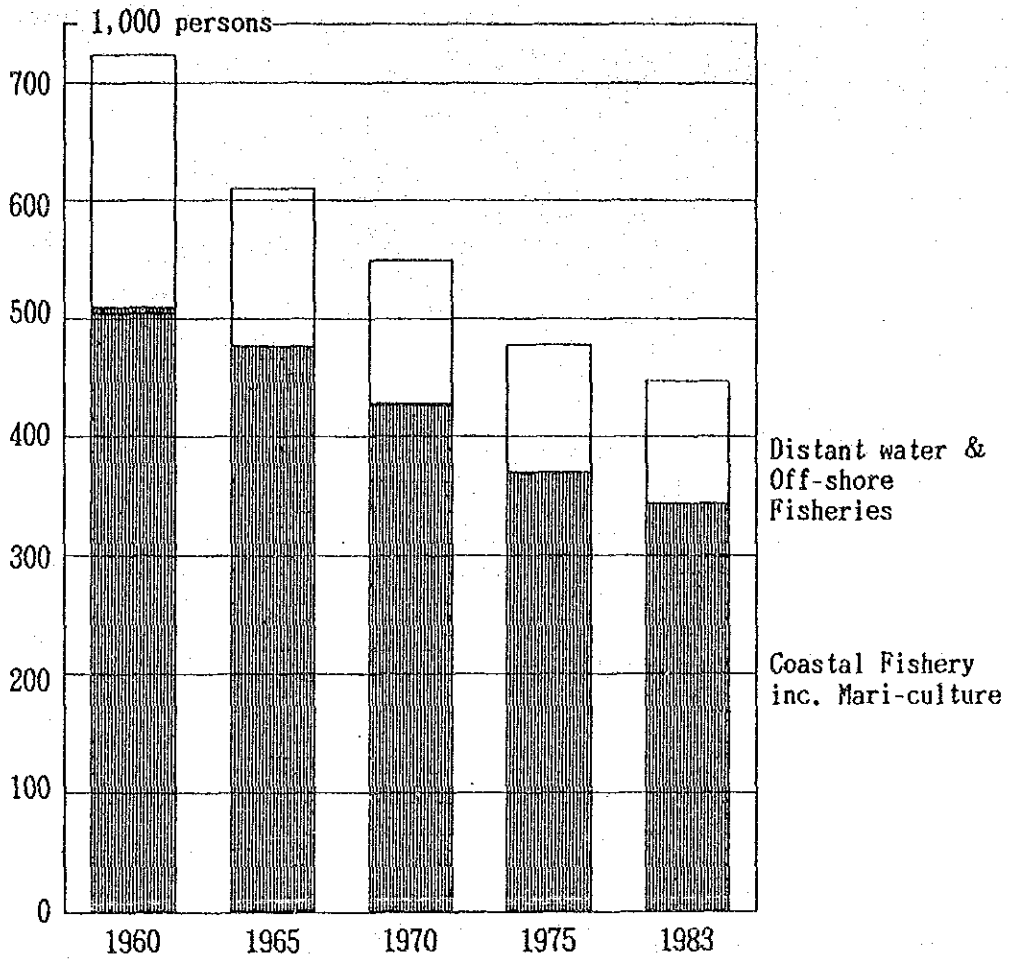


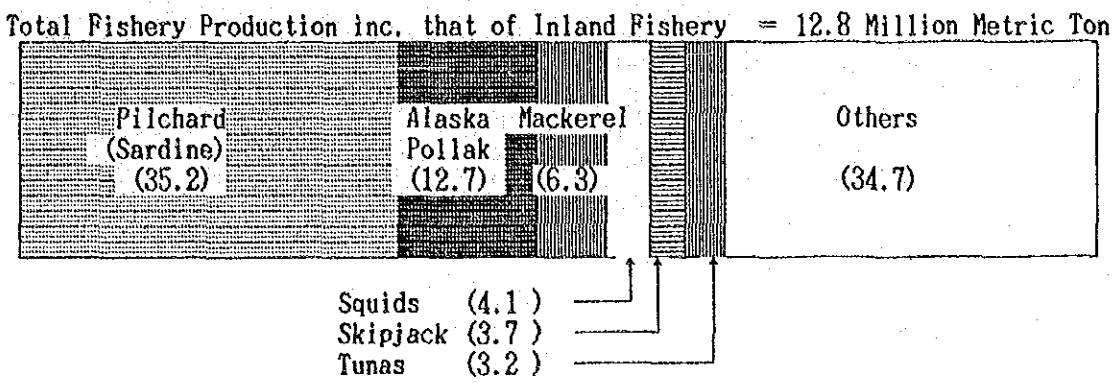
Fig. 4 Number of Fishermen, 1960-1983



(Note) i. Fishermen here refer to persons who actually engaged in fishing at sea. Therefore, those who assisted unloading catch or loading fishing materials at the shore or who engaged in the repairing fishing net and gear on land are not included.

ii. Figure indicates marine fishermen only.

Fig. 6 Total Fishery Production by Major Species, 1984



(Note) 1. Figures in parenthesis is % against the total production.

2. Others are mainly composed of high value fish.

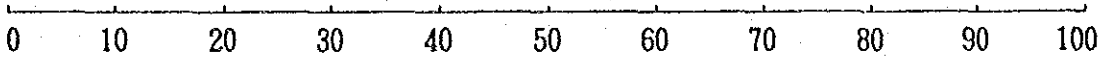
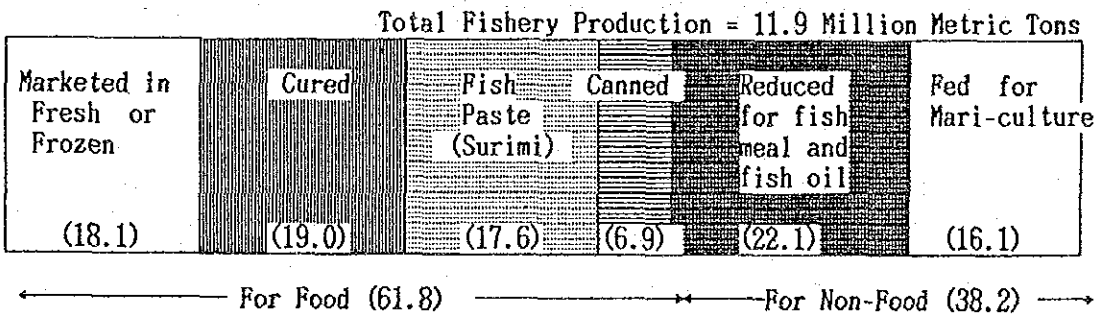


Fig. 7 Disposition of Catch, 1984



(Note) i. Total fishery production covers both marine and inland fisheries, but it excludes sea-weed production.

ii. Figure in bracket is % against total fishery production.

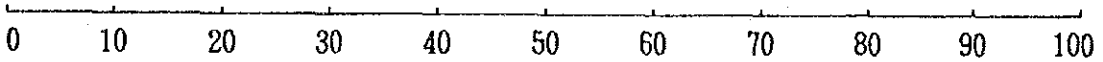
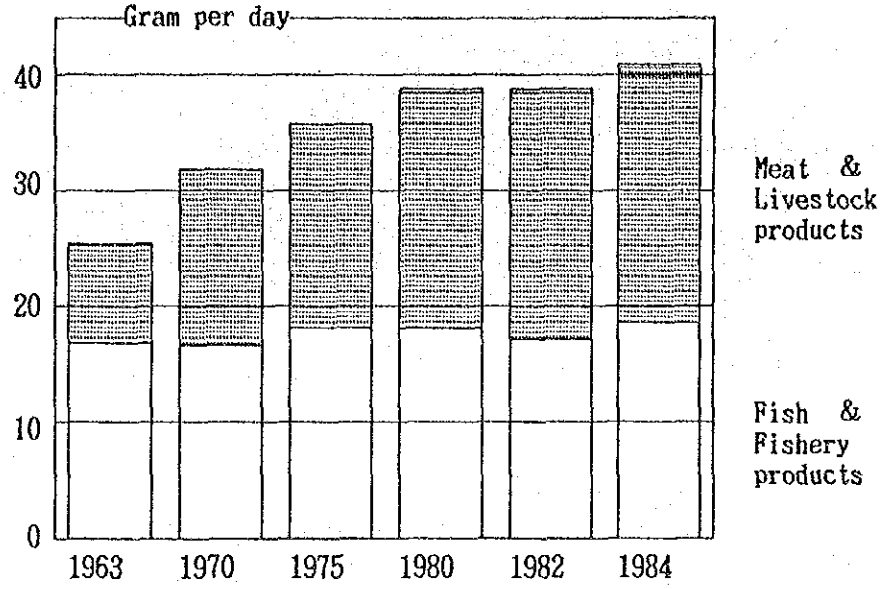


Fig. 8 Per Caput Animal Protein Supply, 1963 - 1984



(Data Source) Food Balance Sheet of Japan

Fig. 9 Consumer's Price Index Number, 1975-1983

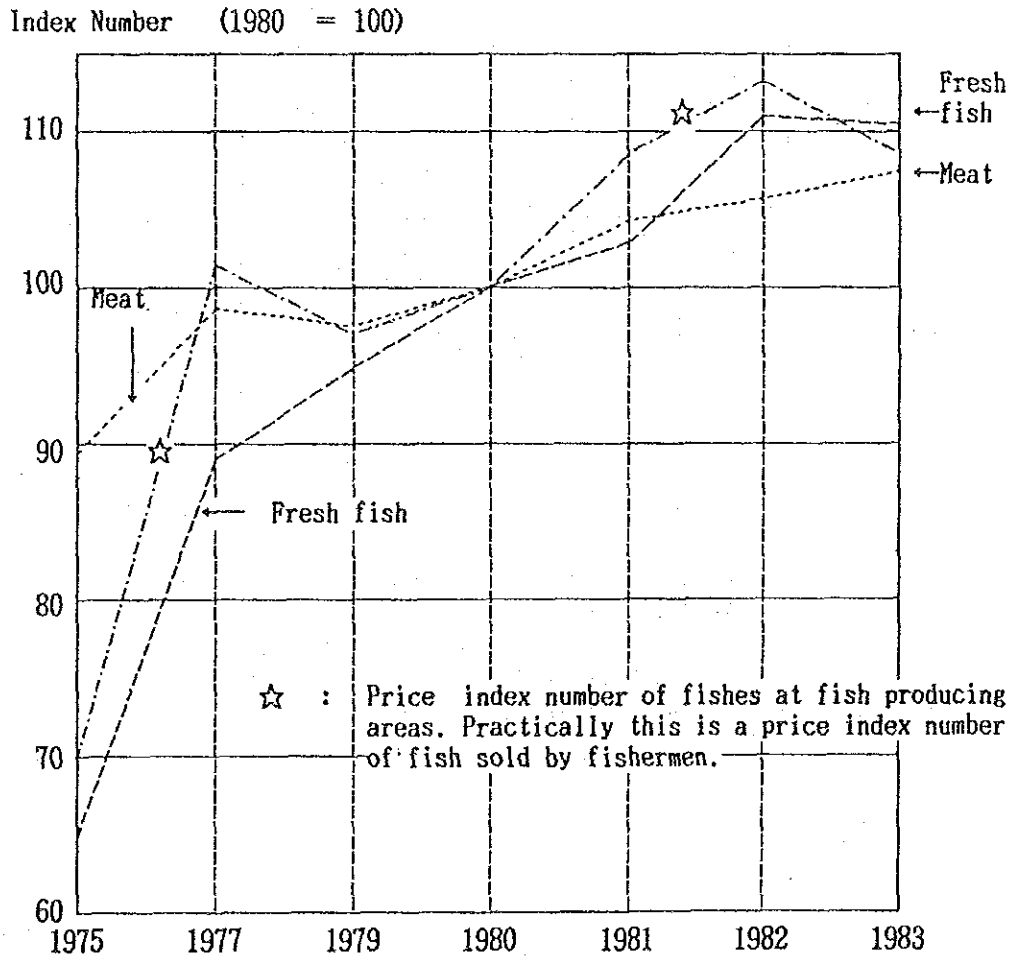
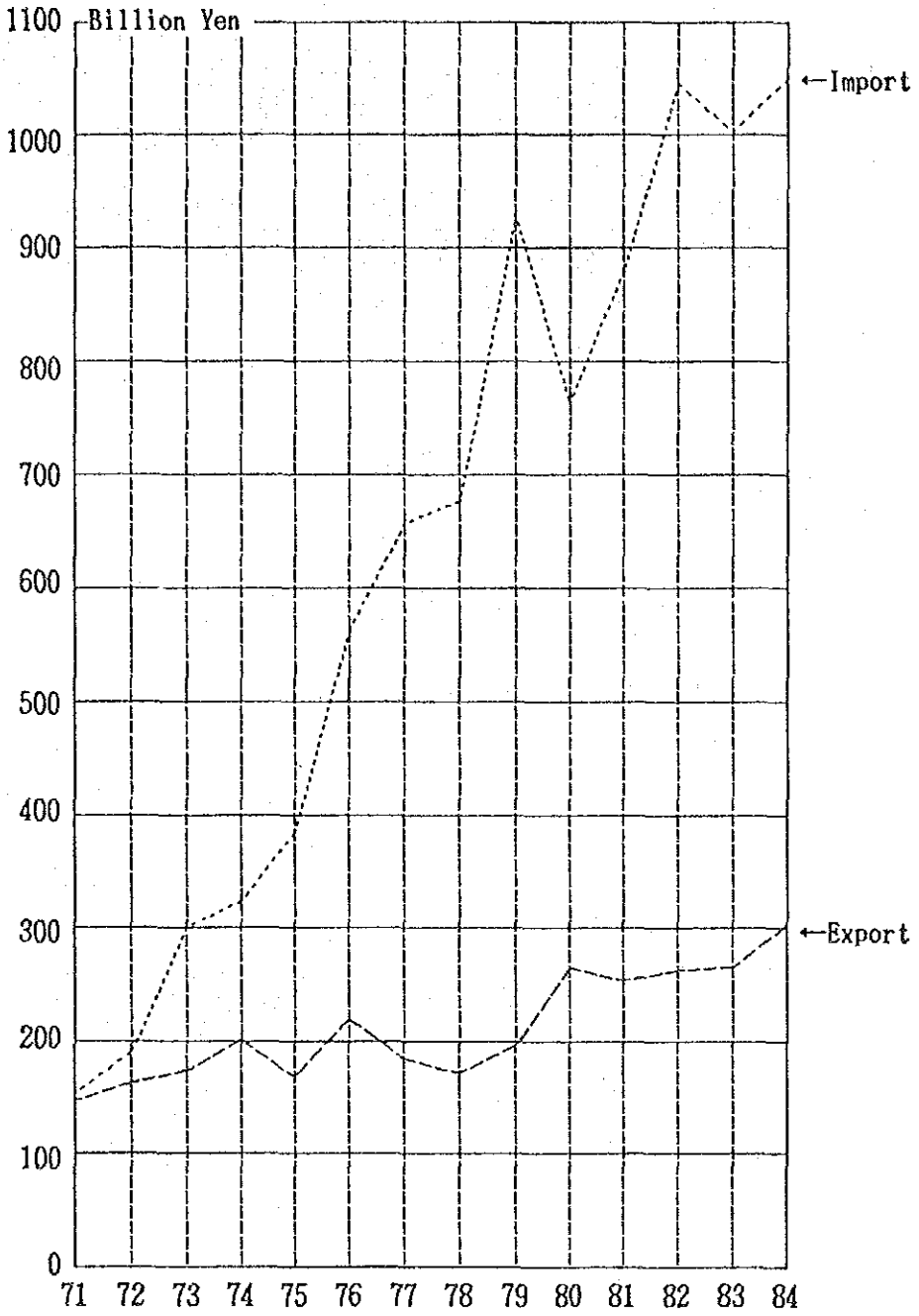
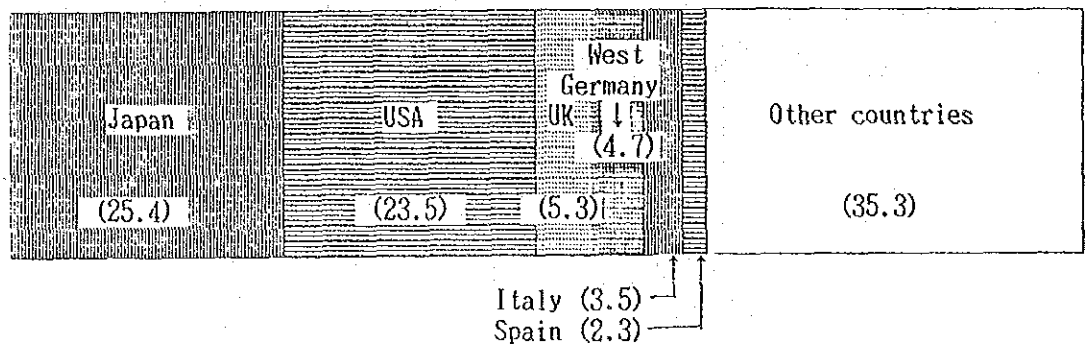


Fig. 10 Import and Export of Fishery Products, 1971-1984



(Note) Import value of fishery products in 1984 was 1,050 billion Yen, which was about 4.2 billion US $.

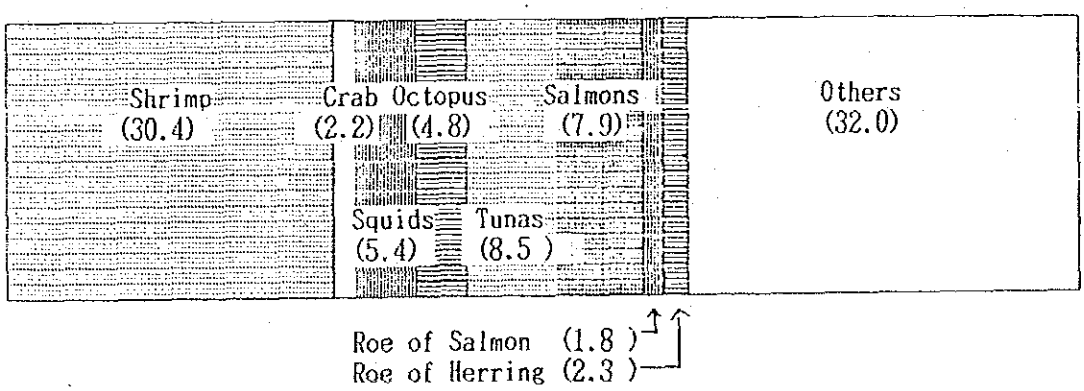
Fig. 11 World Import of Fishery Products by Major Countries, 1984



(Note) 1. World total import of fishery products in 1984 amounted to US $ 16,358 million.

2. This diagram is drawn based on import values, and figure in bracket is % against the world import value.

Fig. 12 Import of Fishery Products by Major Commodities, 1984



(Note) 1. Total value of fishery products imported to Japan in 1982 was 4.2 billion US $.

2. Figure in bracket is % against the total value of fishery prducts imported to Japan in 1982.

Fig. 13.1 Incomes of Fishing Household, 1984

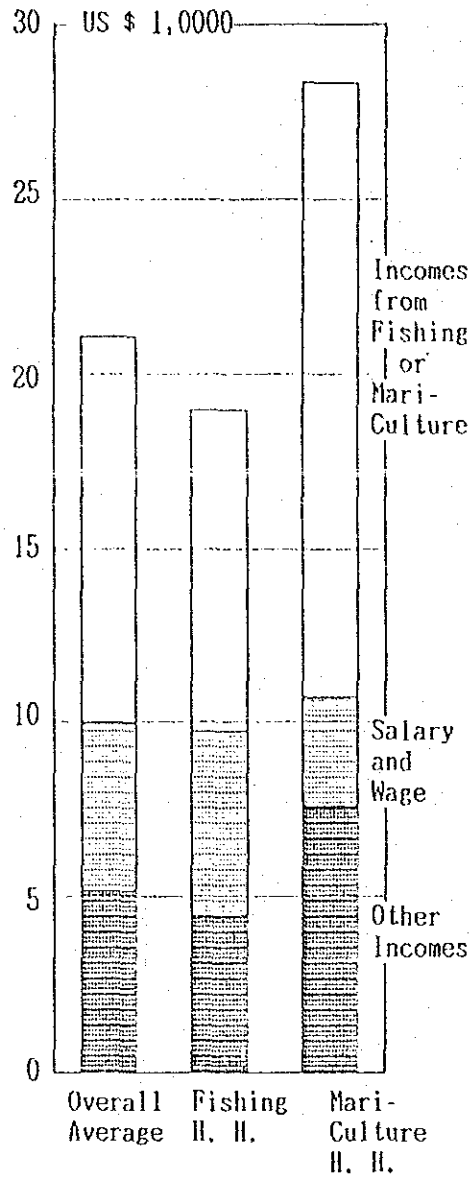
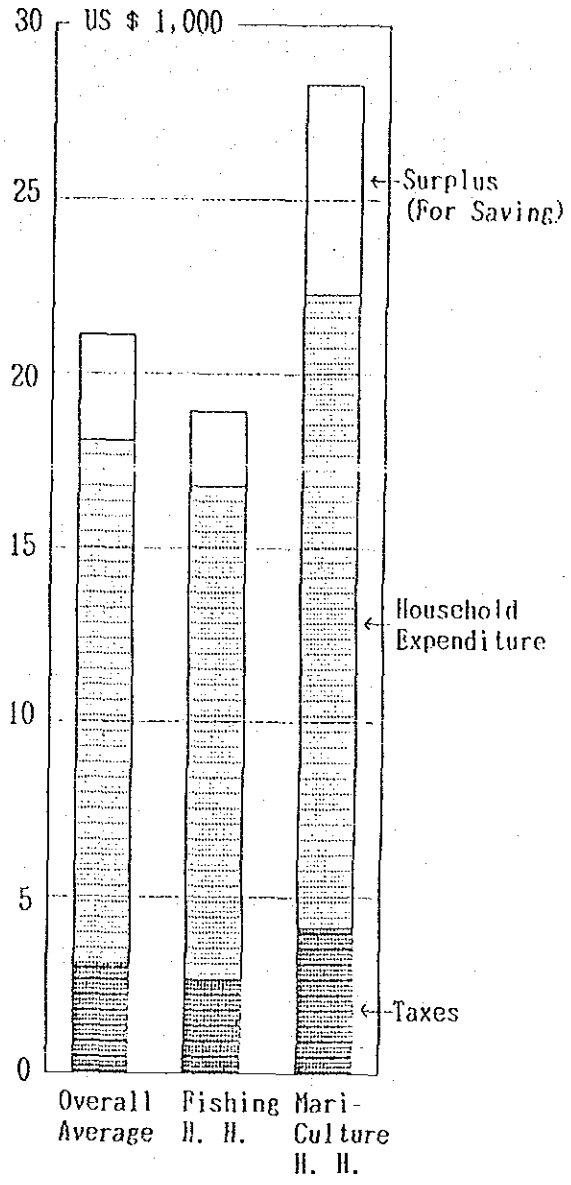


Fig. 13.2 Fishing Household Expenditure, 1984



(Note) Overall Average : Overall average throughout all fishing and mari-culture households.

Fishing H. H. : Fishing household mainly engaged in fishing with a fihing boat.

Mari-culture H.H.: Fishing household mainly engaged in mari-culture.

Table 1. Costs and Earnings of Industrial Fisheries
Using a Boat of 10 gross tons and above

Unit : US $ 1,0000

		1980		1982		1984	
		$ 1,000	%	$ 1,000	%	$ 1,000	%
Total Sale	(A)	536.8		575.2		533.2	
	Total Cost (B)	543.6	100.0	569.2	100.0	532.4	100.0
C	Labour	189.6	34.9	198.4	34.9	189.2	35.5
o	Fuel	112.8	20.8	125.2	21.9	104.0	19.5
s	Maintenance *1	54.0	9.9	54.0	9.5	51.2	9.6
t	Depreciation	60.0	11.0	63.6	11.2	59.2	11.1
	Others	127.6	23.5	128.0	22.5	128.8	24.2
Wage for Family *2 (C)		6.0		6.8		6.4	
Profit (A) - (B) - (C)		- 12.8		- 0.1		-5.6	

(Data Source) Report of Fishery Economy Survey, Ministry of Agri., Forestry and Fishery, 1985

(Note) *1 Maintenance cost for fishing boat and fishing gear.

*2 The operator of a fishing boat and his family members may work aboard the boat. Their saraly and wage have been imputed herein, assuming that they were paid.

Fisheries Institutions Needed for the Management of Tropical Living Aquatic Resources

Tadashi Yamamoto

Fisheries Institutions Needed for the Management of Tropical Living Aquatic Resources

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Abstract

In the present paper existing fisheries institutions (national laws of fisheries) in Southeast Asian countries were reviewed to see whether or not they are really effective to fishery management under the current situations of their fisheries. As a result, it was noted that they are in need of revision for the proper management of fisheries as well as fisheries resources.

Almost all fisheries resources in the world have been fully exploited. With this in mind FAO held an Expert Consultation on the Regulation of Fishing Effort, January 17-26, 1983, Rome, for which the author was present. The Consultation made a through review of all possible management measures. One of its pertinent findings was that developed countries had made many mistakes in managing their fisheries. It was, therefore, suggested that developing countries should not follow what developed countries did as they were. The Consultation also pointed out that management measures through total allowable catch system which is now being adopted in many developed countries may not be applicable to tropical countries for many reasons.

The present paper suggests that a fishing property right system for artisanal fishery and a strict license system for industrial fishery which follows a principle of limited entry be seriously considered.

I Objective and Terminology

The role of national fishery offices is, in principle, to render various services to fishermen of both artisanal and industrial nature, although in certain occassions they have to be responsible for law enforcement for them. Such services include the issuance of fishing permit, fishing license, etc., granting fishery credit, providing fishery infrastructures, providing fishing boat insurance scheme and so forth. These services are normally rendered based on various fisheries institutions (laws) which were approved by national assembly or parliament. Of these institutions the present paper critically

reviews those which are currently in force for the purpose of fishery managemet, on the basis of which some proposals are made with respect to the revision of these laws so as to fit them in the prevailing situations of tropical fishery.

In the present paper two specific terms, i.e., "Artisanal fishery" and "Industrial fishery", are often used with the following meanings. The former is a fishery undertaken by the family members of a fishing household for their livelihood, while the latter is the one undertaken with hired fishermen to pursue a profit. Needless to say, in a fishery of tropical countries the artisanal fishry is the mainstay which has been in existence for many centuries, although there has been a marked growth of industrial fishery which particularly appeared after the World War Ⅱ. Owing to such a dual structure of marine fishery in tropical countries the industrial fishery has now caused many conflicts against the artisanal fishery and has further threatened the fisheries resources through its overexploitation. For the implementation of fishery management in tropical countries these two problems have to be kept in mind.

Ⅱ Review of Fishery Regulations Currently in Force

Current fishery institutions in some Asian countries are reviewed, and some pertinent points in relation to fishery management are illustrated hereunder

1. Review of National Fishery Institutions by Countries

(1) *Philippines*

Fisheries in the Philippines are administered by the Fisheries Decree of 1975 (Presidential Decree No. 714), which is a revision and consolidation of all previous laws and decrees affecting fishing and fisheries. However, the Decree still retains all basic principles with respect to fishery management, which were set out in the previous Fishery Act enforced as early as 1910 when the country was under the regime of U.S.A. According to the Decree the marine capture fishery is classified into (i) *commercial fishery* which operates in water more than seven fathoms (12.8 meters) deep with the use of fishing boats more than three gross tons and (ii) *municipal fishery* which uses fishing boats of three gross tons or less or does not use any fishing boat. Administratively the former is under the jurisdiction of the Bureau of Fishery and Aquatic Resources (BFAR) of the central government, whereas the latter under the jurisdiction of a numder of municipal governments scattered along the sea coast. Both BFAR and municipal governments issue fishing licenses or grants, fishing privileges to individuals, to whom fishery fees are imposed.

For the fishery management a principle of limited entry is unlikely followed even at the present moment when many fishery resources are said to have been over-exploited here and there. Despite of a great progress of her marine fishery that has been achieved during the past 60 years a border of 3 gross tons is still retained as a criterion to distinguish between small scale fishery and industrial fishery.

(2) *Thailand*

Government activity in fisheries dates from 1901 when the Fishery Revenue Division of the Revenue Department was established in the Ministry of Finance. Then, in 1926 the Department of Aquatic Animal Conservation was formed in the Ministry of Agriculture to improve, maintain and carry on the propagation of aquatic animals. Nevertheless, over some 20 years thereafter the Ministry of Finance still had authorities to limit and restrict the area and time for fishing, to limit the kind of fishing gear, to issue fishing licenses and to collect taxes or fees relating to fishing. All these functions were transfered to the Ministry of Agriculture in 1947, when the Fishery Act was promulgated. The Act stipulates the same functions as was performed by the Ministry of Finance. According to the Act, with the exception of minor fishing gears like cast net all fishing gears have to be registered, and such a registration has to be renewed every year to ensure the collection of fishery revenue. However, the Act did not stipulate any provision to restrict the number of fishing gears. As a result, a trawl fishery which was initiated in early 1960s expanded its fleet size and depleted the demersal fishery resources both in the Gulf of Thailand and Anderman Sea within a period of only twenty years. The Act did not give any provision, by which the government can take any appropriate action for the management of fishery resources. It is said that only in recent years the government decided to restrict the number of fishing licences to be issued to the trawl fishery.

(3) *Malaysia*

Fisheries in Peninsular Malaysia is administred by 1963 Fishery Act and Marine Fishery Regulation established in 1967 based on the said Act. According to the Regulation a fishing license is granted to anyone if he deposits a certain amount of money and pays a license fee to the government. Although the Regulation has a provision, by which the government can limit the number of fishing licenses to be issued, no measures for this provision was taken until 1980 when a decision was made not to issue any more new fishing license for trawlers. By that year the number of trawlers had already exceeded 4,400, which accounted for almost one fourth of the total number of in-board powered boats catching nearly one half of the total marine fishery production. Over twenty years after 1962 when a trawl fishery was introduced into Malaysia the government has been bothered by the fishery which invades into the fishing ground of coastal fishermen, resulting in serious conflicts and depleting precious demersal fishery resources. The Fishery Regulation currently in force, however, does not have any provision

to set up a mechanism, by which a matter of fishery management is democratically examined with the participation of fishermen.

(4) *Indonesia*

Unlike other Asian countries Indonesia does not have a national law of fishery, although some attempts have been made to have it. Instead, there are several pieces of fishery decrees which were issued either by the president of Indonesia or by the minister of agriculture whenever such needs arose. When her trawl fishery appeared in Indonesia some years ago, Directorate General of Fisheries of the central government set up the total number of licenses to be issued for trawlers, which was allotted to each province. Owing to a rapid increase in the number of trawlers, however, the quota was suddenly exhausted. As a result, a great number of illegal trawlers appeared. Naturally both legal and illegal trawlers gave a great trouble to artisanal fisheries. The government paid every effort to alleviate the situation by prohibiting the construction of new trawlers and by establishing closed areas. These attempts were, however, all in vain. Therefore, the government finally took a decision on the total ban of trawl fishery in 1980. Like other Asian countries, fishery fees are also imposed to fishermen according to the type and size of gear employed. Besides, fishermen have to pay so-called "Retribusi" whenever they land and sell their catch through fish auction market. The rate of the Retribusi ranges from 5 to 7% of the sale value of catch. Such a system is said to have been established during Dutch regime. There is no mechanism, through which a matter of fishery managent is democratically studied between government and fishermen.

2. Summery Account of the Review

Having made a review of the existing fisheries institutions in Asian counries the situations could be generalized as follows :

(i) Artisanal fishermen are greatly suffered from the invasion of highly efficient industrial fishery and are lossing a right to operate in coastal waters. Furthermore, fisheries resources are generally under heavy pressure of industrial fisheries particularlyl by trawl fishery and are being deteriorated.

(ii) At present fishery management is undertaken with a sense that fishery resources are the property of the government. For this reason emphasis is given in the fishery institution to impose various fishery taxes to fishermen. There is no mechanism to examine a matter of fishery management with the partcipation of fishermen.

(iii) Fishery institutions which were established while the countries were under their previous suzerain are still kept and in force. Since these fishery laws were drawn while neither conflict between artisanal and industrial fisheries nor overexploitation of fishery resources by the latter were in existence, they are not capable of overcoming these problems.

Ⅲ Background Informations by Which Proposal was Made

1. FAO World Conference on Fisheries Management and Development

In compliance with the new regime of sea which has now extended national jurisdictions over aquatic living resources in 200 miles zones from the sea coast FAO convened a World Conference on Fisheries Management and Development which was composed of two phases ; one was a technical preparatory phase, 10 to 19 Octover, 1983 and the other a final policy phase, 27 June to 6 July 1984. The backgrounds for the Conference were among others as follows :

(i) According to the new regime of sea coastal countries are now fully responsible for fishery management over aquatic resources in their 200 miles economic zones. This means that coastal countries have to take concrete measures to achieve the optimum utilization of fish resources from the economic, social and nutritional point of view.

(ii) FAO estimates that the world fishery production could be increased from 75.3 million metric tons in 1980 to 92.5 million metric tons with additional production of 17.2 millon metric tons, of which 14.5 million metric tons or 85 % are to be derived from developing countries. In this regard, as the majority of fisheries resources in the world have been over-fished beyond their maximum sustainable yield (MSY), those which remain unexploited or under explcited are a few. FAO further assumes that the additional production of 17.2 million metric tons could be realized mainly through a proper fishery management. This means that for almost all fishery resources including those in tropical areas fishing effort has to be reduced so as to recover their MSYs. As a matter fact, this is due to an over-investment to the fishing industry, which in turn has resulted in an over-capacity of fisheries against the availability of fisheries resources.

2. FAO Expert Consultation on the Regulation of Fishing Effort

In preparation for the said World Fisheris Conference, FAO held, in the first half of 1983, a series of seminars, workshops and consultations. One of them was the FAO Expert Consultation on the Regulation of Fishing Effort held in Rome, 17-26 January 1983, for which the author was present. The Expert Consultation made a through review on all approaches to regulate fishing effort as listed below :

(i) Regulation by total allowable catch (TAC)
(ii) Alternative approaches to effort regulation, e.g. closed area, closed season, mesh size regulation, etc.
(iii) Regulation of effort by fishing license (Limited entry).
(iv) Regulation of effort through monetary measures.

(v) Regulation of effort through fishing property rights granted to fishing communties.

(1) *Evaluation of Management Measures*

The following were the outcomes of a ten days long deliberation to evaluate advantage and disadvantage of each management measures, which were excerpted from the report of the Expert Consultation.

(i) *Regulation of fishery by TAC* as being adopted in the North Atlantic and the North Pacific can in principle solve the conservation problem for single species. When the fishery management is done by this measures alone, the fishery fleets may still posses capacity in excess of that needed to harvest the sustainable yield. The resultant political and social pressures can put the conservation objectives at risk. Good statistics are essential for applying TACs. Enforcement and the necessary regular scientific monitoring involved in TACs can be extremly expensive. TACs are also of limited value in multi-species fisheries in tropical waters.

(ii) *Indirect methods* such as closed area and mesh control have often been the first to be applied to a fishery. Especiallly when they can ensure protection of the fish untill they have spawned at least once, they can by themselves achieve adequate protection of the resources. Mesh regulation and closed area, when they are applied to trawl fishery, can make major contribution to improved management. Indirect methods can generally be understood and accepted by fishermen; therefore, they are valuable and can be enforced relatively easily.

(iii) Direct control over the number of fishing vessels through *Limited entry* or *licensing appears to offer the best chance of solving the problem of overcapacity. In* principle this approach should also solve the conservation problem. In the long run, however, this approach in terms of the number of vessels alone will lead excessive capacity through improvement in the size and efficiency of the individual vessels. Therefore, license limitation should always include controls on the effective *fishing capacity of the individual licensed vessel, e.g. on tonnage and horsepower.*

(iv) *Money measures* i.e., financial support including subsidies, direct taxes or tax structure (e.g., depreciation rates) can be used either increase or reduce fishing effort and can be useful strategic tools to guide the decision by fishermen, fishing companies or *investers in desired ways. However, they can be misused, as financial* support usually are being kept on too long. Where forms of financial support can make useful contributions, e.g., in stimulating the growth of fishing on an underutilized stock, they should be kept on only for a very limited period. Taxes would be most useful in the final phases of successful management to funnel off

excessive profits, and should mainly be used to cover management costs.

(v) *Fishing property rights* have many advantages when they are applied to fishing communities. Fishermen consider the fish stocks as their property, and they will adopt a more positive attitude to conservation and management measures. Furthermore, enforcement is usually easier and cheaper. In general, therefore, the Consultation felt that fishing property rights are among the more promising approaches to fishery management, especially in developing countries densly inhabited by artisanal fishermen.

(2) *Main General Conclusion of the Consultaion*

In summery, the main general conclusions of the Consultation were as follows ;

(i) Fishery management is essential. Without adequate management fisheries cannot produce the large benefits they are capable of.

(ii) Developed countries particularly bordering the North Atlantic have made many mistakes in managing their fisheries due largely to lack of ability to control the fisheries off their coasts as a result of the previous international ocean regime. Therefore, developing countries may find it more valuable to learn from these mistakes than to attempt to use current practices in developed countries as examples.

(iii) Fishery management can be costly for research and enforcement especially when the TAC measures are applied. Decision on the type of management must take into account the balance between cost involved and the benefits to be expected.

(iv) Fishermen and others like fish merchants and fish processors should be involved in fishery management. They should have the opportunity to participate in all stages from the design and choice of management measures to their implementation and enforcement.

(v) There is no single simple way of regulating fishing. Successful regulation involves using the correct mix of regulatory and other tools available. The mix of tools employed must be matched to the specific conditions of each fishery.

(vi) Management can not be separated from development. Often indiscriminate actions taken to encourage the growth of a fishery (e.g., introduction of subsidies) can have serious impacts on the later success of management. Therefore, administration of fishery, "development" and "management", should be closely integrated.

(vii) The Consultation was held with the participation of experts who were mostly

from developed countries bordering the North Atlantic and North pacific, focussing their deliberations to these sea areas. The Consultation, therefore, recommended strongly to have similar meetings at regional level focussing to the pattern of fisheries prevailing in tropical areas, which are quite different from those in developed countries.

3. USAID Coastal Zone Management Workshop

In November 1981 the U. S. Agency International Development (USAID) in Manila sponsored a coastal zone management workshop. The purpose of the workshop was to involve Philippine fishery managers and repersentatives of interested agenciess in planning for possible participation in the further development of existing poor coastal fishing communities. Some major outcomes of the workshop are dealt with in an article entitled "Dilemma of the Small-Scale Fishermen" in ICLARM Newsletter, Vol. 5, No. 3, July 1982.

The workshop has well identified the Dilemma of the Small-Scale Fishermen from every possible angle, which are highligted below ;

(i) Biological overexploitation of fisheries in the sense that more fish could be caught if less fishing was done,
(ii) Economic overfishing in the sense that income from fishing is being wasted in the purchase of unnecessary boats, gear and fuel,
(iii) Increasing numbers of small scale fishermen splitting the catch into increasingly small shares, and
(iv) New competition from modern fishing boats capable of harvesting significant portions of the available fish quickly and easily.

One of proposals disccused in the workshop was that of changing common property concepts with respect to fishery resources. In this regard, the workshop noted that shifts away from "central management" and related common property concept toward "local management" and related property ownership concept would be useful ; however, the political and legal problems and complexities of such changes were not underestimated. The workshop further noted that in spite of difficulties, the advantages of involving resources users in decisions concerning management of the stocks they use (assigning them some property right) are tremendous, and mechanisms for moving in this direction may involve increased regional or municipal authority and involvement of fishermen's association in management decision.

In fact the workshop is the first of its kind in Asian tropical countries that clearly stated over exploitation of even coastal fishery resources and usefulness of establishing a fishing property right for artisanal fisheries. The workshop discussed, to a great

extent, how the fisheries resources be allocated through the fishing property right system, to whom the property right would be granted, how the property right would be utilized among fishermen in terms of equity, and so on. However, no concrete conclusion seems to have reached in the workshop. In this regard, a mention must be made herein that the fishing property right system for coastal fishermen has been firmly established in both Japan and Korea. In those two countries the fishing property right is, in principle, granted to fishery cooperatives.

Ⅳ Proposals for the Improvement of Fishery Management in Tropical Countries

1. General Principle

As assessed by the FAO expert consultation on various different management measures, fishery management through TACs is not applicable to tropical countries due to absence of good statistics, extremly high cost involved in its implementation and multi-species fisheries. (See (i) of (1) of 2 of Ⅲ above) Under such circumstances it may be worthwhile to consider the following two principles in the management of fisheries and fishery resources in tropical countries particularly in Souteast Asia.

(i) The right to operate in costal waters by artisanal fishermen must be well protected. Industrial fishery should be under the strict control to avoid a conflict against artisanal fishermen and to conserve particularly coastal fisheries resources.

(ii) The concrete measures for fishery management should be sought with the full participation of fishermen on the prerequisite that fishery resources are the property of fishermen. For doing so, the government should provide a certain mechanism through its fishery institution, in which a matter of fishery management is democratically disscussed and determined taking fully into account the views of fishermen concerned and also under the guidance of the government.

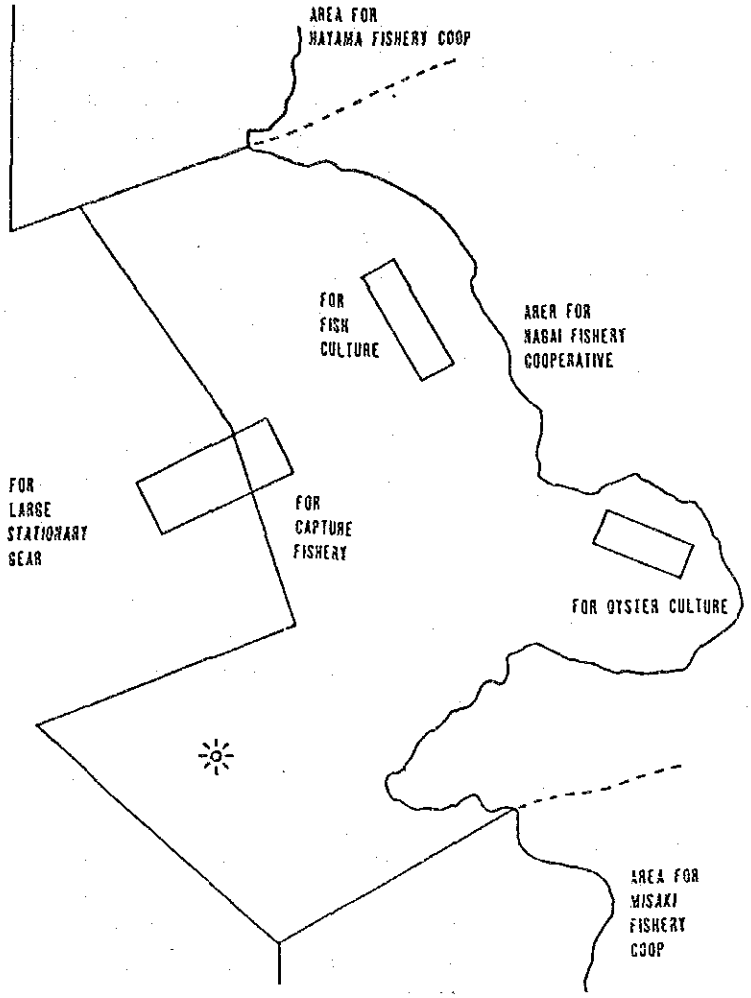
If these two principles are generally accepted, it would be most appropriate that a fishing property right system be applied to the artisanal fishery and a fishing license system which strictly follow the principle of a limited entry to the industrial fishery. Further details of these ideas are illustrated in 2 below.

2. Proppsed New Fishery Institutions

(1) *Fishing property Right System for Artisanal Fishery*

The fishing property right which is hereunder refered as a fishing right is a right to make exclusive use of a certain coastal sea area for capture fishery or aquaculture. In such a fishing right (i) sea area for which the right is in effect, (ii) the type of fisheries resources that can be exploited and (iii) the type of fishing gear or aquaculture that can be employed are clearly defined. With these fishing rights fishermen can fully

Fig. 1 Fishing Right Granted to Nagai Fishery Co-operative Society



Notes

(1) The figure indicates the actual locations of sea areas of four different types of fishing rights granted to "Nagai" Fishery Cooperative. *The one for capture fishery* covers the entire sea area right off the whole area of Nagai Fishery Co-operative Society up to approximately 2 to 3 Kilo Meters from its sea coast. On the contrary, *those for large stationary gear known as "Otoshi-ami", fish culture* and *oyster culture* occupy particular parts of the sea area of the former, which are suitable for these fisheries and are indicated by rectangles respectively.

(2) The fishery cooperative is resonsible for fishery management through such fishing rights with the full participation of its all members. For doing so, for every fishing right a specific regulation has been established with respect to the democratic use of the fishery resources and fishing area specified by the right, by limiting the type and size of fishing gear which can be employed, by specifying closed area, closed season and the way of allocating the actual site of fishing ground for small stationary gear and mari-culture to the members and so forth.

enjoy their fishing operation by rejecting the interference of the third parties. In principle, the fishing right is to be granted to a group of fishermen, possibly fishermen's association or fishery cooperative. An example of such fishing right systems as has been developed in Japan can be seen in Fig. 1.

When a fishing right is granted to a fishing community or fishery co-operative, there will be many advantages as follows :

(i) As fishermen consider the fish stok as their own property, they themselves establish their own rule to make best use of it.

(ii) No administrative cost is required for the issuance of a fishing license to so many individual fishermen as practised in many developing countries. Thus, a fishery officer can afford his time for more useful works

(iii) Fishermen themselves play a role of surveillance for the invasion of industrial fisheries, and hence no law enforcement is required by governments.

(iv) A fishing right granted to a group of fishermen will enhance the establishment of fishermens' organization, as they are not allowed to fish unless they are its members.

(2) *Fishing License System for Industrial Fishery*

In the system, not only the number of boats to be licensed but also the fishing capacity of individual boat in terms of e.g. gross tonnage, horse power, landing place, area allowed to fish, season allowed to fish, the size of gear, etc. are strictly specified. Ideally, two different types of fishing licenses should be considered. One is for fisheries which operate within sea area right off a certain province, and the other for fisheries which operate in sea areas of two provinces or more. In the former a fishing license will be issued by the governor of respective province, whereas in the latter by minister of agriculture of the central government. How to distinct between these two different fishing licenses will be determined taking into account actual fishing area.

The problem of marine fishery in Southeast Asian countries is an overcapacity of industrial fishery, which has led a severe conflict to artisanal fishery and threatened fisheries resources. Under srch a situation, what should be done may be as follows ;

(i) At first, the type of fishery e.g. trawl, purse seine, etc. which requires a fishing license has to be determind.

(ii) Then, for each of such a fishery any boat unlicensed has to be licensed if such a boat stiil exists.

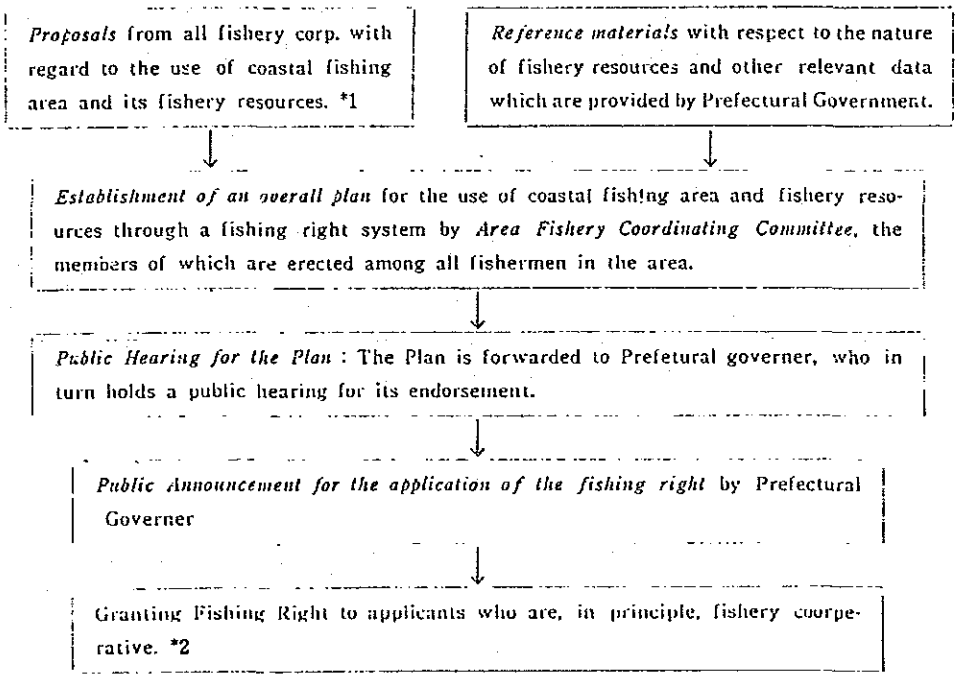
(iii) When an immediate reduction in the number of boats is not possible, a system by which an individual boat takes a rest by rotation may have to be considered. In this way catch per boat per year may not decline, but the size of profit as well as the size of catch per trip may increase in relation to the reduction of operational cost.

(iv) In parallel with the above measures attempt should be made to reduce the number of fishing boats. This could be best achieved if fishermen who will remain could compensate those who are leaving. To facilitate such a compensation system the government may provide fishermen who remain with a special credit with low interest or supplement a part of the interest when they are in need of fishery credit.

(3) *Participation of Fishermen to Support Proposed Fisheries Institution*

The above two systems can be successful only when full participation of fishermen is assured.

Fig. 2 Process fo the Establishment of Fishing Right System in Japan



*1 Such a proposal is prepared by a fishery coorperative taking into account the ideas of its all members.

*2 Fishing right is sometimes granted to individuals or companies only in case of large stationary gear known an "Otoshi-ami" and pearl culture, which require a large amount of capital.

As for the fishing right a fishery coordinating committee, the members of which are erected from fishermen, will have to be established for each region, province, etc. where a patern of fisheries is more or less homogeneous. The committee will work out an overall plan with respect to how to establish fishing rights taking into account the ideas and proposals made by all fishermen. After the plan was concluded, it will be forwarded to e.g. a provincial governor or the minister of agriculture for approval. Then, the fishing right is granted by the respective office to a group of fishermen on the condition that they have been organised into their own fishermen's association, cooperative, etc. and are really willing to make the best use of fishing ground and fishery resources with their own responsibility. Such a mechanism can been seen in Fig. 2, which is an example of Japan.

As for the fishing license system there should be a prerequisite that fishermen who engage in industrial fisheries be organized into a sort of their association or cooperative. Such a fishermen's organization may be established for each type of fishery and for each area concerned. Then, management measures as suggested in (2) above will be discussed and finalized through the mechanism of their organization and also in consultation with the government

There will be, however, a need to coordinate various management measures proposed by differnt classes of fishermen's organization. Therefore, a central fishery coordination committee the members of which will be appointed probably by the government may have to be established to maintain the harmony of various management measures proposed by lower organizations.

V Conclusions

The existing fishery institutions (laws) in many developing countries which were mostly promulgated while they were still under their previous suzerain have now become serious barriers for the implementation of proper fishery management. This is due mainly to the dual structure of their fishing industry composing of artisanal and industrial fisheries, which occured after the World War II. It is. therefore, urged that existing fishery institutions be thoroughly reviewed and revised so as to cope with the present situations of their fisheries. Application of a fishing property right to artisanal fishery and a fishing license system with a principle of limited entry to industrial fishery as developed in Japan and Korea is likely to be one of the best solutions.

Nevertheless, so far no attempt has been made to see whether or not the fishery institutions as has been proposed herein are applicable and feasible to developing countries. Under the Exchange Program for Joint Research which was agreed on between

College of Economics, Nihon University, and Faculty of Economics and Administration, University of Malaya on Octover 26, 1983, therefore, a pre-test survey has been intiated by the author and Dr. Jahara Yahaya, Assisant Professor of Fishery Economics. Dr. Yahaya has already been in Japan to be familiar to the fishery institutions developed therein, and an actual field survey may take place in Malaysia probably from April 1985.

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Fisheries Infrastructures as Incentives for Artisanal Fishermen To Establish Their Own Fisheries Cooperative

- With Particular Reference to A Nationwide Fish-Marketing Infrastructural Program in the Philippines -

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1. Introduction

Fisheries infrastructures such as fishing port, fish landing pier, shelter for fish marketing, ice plant, cold storage, etc. are facilities indispensable for the development of a fishing industry. The reason why Japan's fishing industry has achieved an extensive development of coastal, off-shore and distant water fisheries was due mainly to the fact that her government made an enormous amount of investment for these infrastructures over the past several decades. As of the end of 1985 there are some 2900 fishing ports throughout the country. Thus, in Japan every fishing village has its own fishing port.

In many countries fisheries infrastructures are provided by the government as public facilities for the use of all those who are concerned with the fishing industry. With respect to the use of these facilities for the benefit of all persons concerned a crucial question arises as to who should be responsible for the management of these infrastructures. In Japan, according to her national law of fishing port the port facilities are built and owned by a provincial government when they are large in size or a municipal government when they are small. However, the management of these port facilities is entirely left to the responsibility of the fishery cooperative in the area. In developing countries the government provides fisheries infrastructures, but there are many instances that these facilities are not fully in use and have often become monuments owing to absence of a body to manage them.

A scarecity of fisheris cooperatives in developing countries has been a great burden for the governments to help artisanal fishermen, who are scattered and numerous in number and their income and living conditions are generally quite low. The government can hardly do anything for them without the fisheries cooperatives as an intermediate. Among ASEAN countries the Philippines is a country, where fisheries cooperative is least developed. By the end of 1983 there were only 20 fishing cooperatives and 72 "Samahang Nayon" for fishermen, which were defined as pre-cooperatives in the Philippines.

Since 1981 the Philippines government has launched, within the framework of her Integrated Fisheries Development Program (IFDP), a Nationwide Fish Marketing Infrastructural Program, which intends to provide her fishing industry with fishing ports, ice plants & cold storages and fish transportation facilities. The Program is particularly directed to the development of her artisanal fishery. Of the Program the construction of fishing ports have already commenced by her Ministry of Public Works and Highway (MPWH). Upon the completion of all fishing ports there will be one national fishing port at Navotas of Manila City, ten regional fishing ports at major fish landing centers and some 180 municipal fishing ports for artisanal fishery. Of these ports the national fishing port at Navotas, two regional fishing ports at Iloillo and Zamboanaga and some municipal fishing ports for artisanal fishery have been completed. However, the programs for the remaining two facilities, i.e. (i) ice plants & cold storages and (ii) fish transportation facilities are still under planning stage by Philippines Fisheries Development Authority (PFDA).

In many developing countries the development of fisheries infrastructures has been considered as a piecemeal work limiting to a certain area of a country. In the Philippines, however, this task is now being taken up as a program for the country as a whole. In the past there was no other developing countries which took up a matter of fisheries infrastructures on a nation-wide scale. In view of this the Program in the Philippines is really ambitious and unique one.

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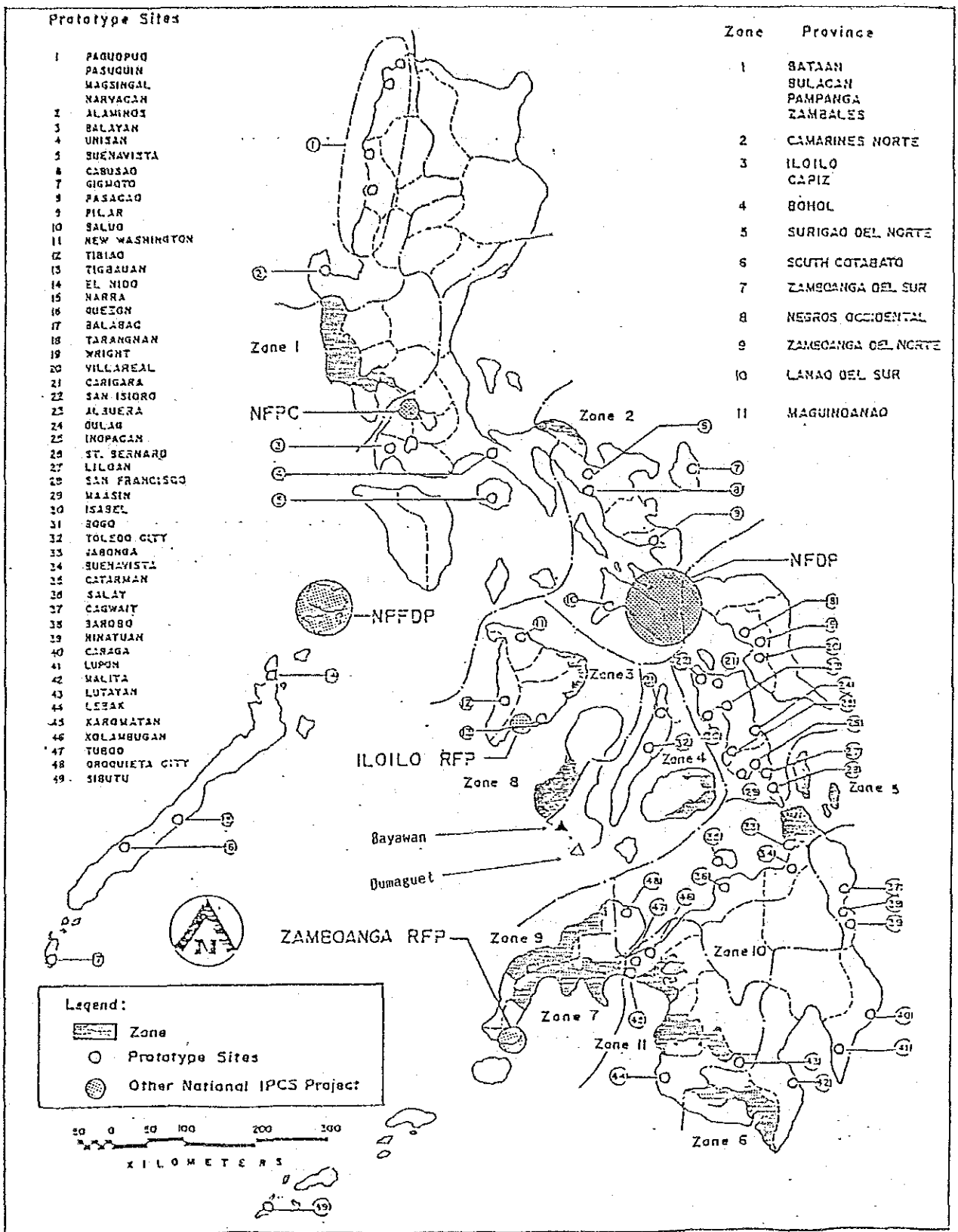

Fig. 1 Location of IPCS Zones and IPCS Prototype Sites

(Data Source) The study of the Master Plan for Nationwide Ice Plants and Cold Storages Network System, JICA March 1985, FOT CR(5) 85-06

In relation to the above Program the Government of Philippines made an official request to the Government of Japan for assistance in the establishment of a master plan for the Nationwide Ice Plant and Cold Storage Network System (IPCS System), which covered the following two aspects of plans:

i. A physical plan indicating the locations of ice plants and cold storages and their capacities, and

ii. A management plan for the IPCS System upon its completion.

In response to this request Japan International Cooperation Agency (JICA), which is a semi-governmental organization responsible for technical aid to developing countries, despatched a study team to the Philippines for about one year up to November 1984. For this study team the author was a chief of the advisory group.

By November 1984 the JICA study team completed with a great success at least a physical plan of the IPCS System. However, the study team was unable to work out any management plan for the IPCS System. In the meantime it was learned from a preliminary report prepared by Mr. M. Hotta, FAO Fishing Industry Officer, that at Bayawan of Negros Oriental Province a fishermen's marketing cooperative was being developed with the provision of a 2.5 ton/day ice plant granted by CIDA. The advisory group, therefore, made a visit to Bayawan Fishermen's Marketing Cooperative (BFMC) to see how the CIDA ice plant is being utilized in relation to the fish marketing activity of BFMC.

Our visit to BFMC which was actually made in early November 1984 was quite useful for the formulation of management options for the IPCS System. Present report deals with our studies made in these respects.

2. Bayawan Fishermen's Marketing Cooperative (BFMC)

2.1 Bayawan Fishermen's Marketing Cooperative in General

Bayawan is a fairly big town with some 300 fishing households and is one of major fish supply centers to Dumaguete which is the largest fish consuming area in Negros Oriental Province as well as its provincial capital. BFMC is located some 102 Kilo meter west of Dumaguete, and both are well linked with a road running along the sea coast although it is not fully asphalted. There are some 300 municipal (artisanal) fishing households which mainly engage in hook & line, gill net and other gears using a boat of less than 3 gross ton. In addition, there are several commercial fishermen who engage in purse seine with a boat of around 10 gross ton. (For the locations of these two places see Fig. 1)

BFMC was organized as a recipient of assistances from the CIDA and was registered with Ministry of Agriculture in November 1983. From its inception BFMC was, among others, supposed to engage in fish marketing between Bayawan and Dumaguete with the use of two units of ice plants and an insulated van, which were to be provided by CIDA. Of the two units of ice plants one has been constructed at Bayawan fish landing center and the other at the site of a provincial office of the Bureau of Fisheries and Aquatic Resources (BFAR) at Dumaguete.

Bayawan fish landing center is located along the left bank of Bayawan River, and it has a 70 meter long staircase type fish landing wharf with an ample land area for the construction of fisheries infrastructures. For the moment a two storied concrete building has been constructed in the area. The second floor is used for housing a 2.5 ton/day flake ice plant, and the ground floor accomodates a fish handling quarter, an ice storage and an office space for BFMC. These facilities occupies only a third of the land area. (See Fig. 2)

2.2 Performance of BFMC as of November 1984

The following were the performances of BFMC as of November 1984 and the author's views for each finding.

i. BFMC had been fully supported by the government

The time of our visit to BFMC was just two months after they started their fish marketing activities upon the completion of CIDA ice plants. There were six advisers who were outposted from BFAR and some ten locally recruited personnels which included director, accountants, clerks, driver and security guards. Their salaries had been fully paid by the government including those who were locally recruited. Thus, it was not possible to say that BFMC was a real cooperative. Nevertheless, it was understood that at its initial stage the cooperative in developing countries like Philippines has to be fully supported by the government, although this is far deviated from an ideal status of cooperative.

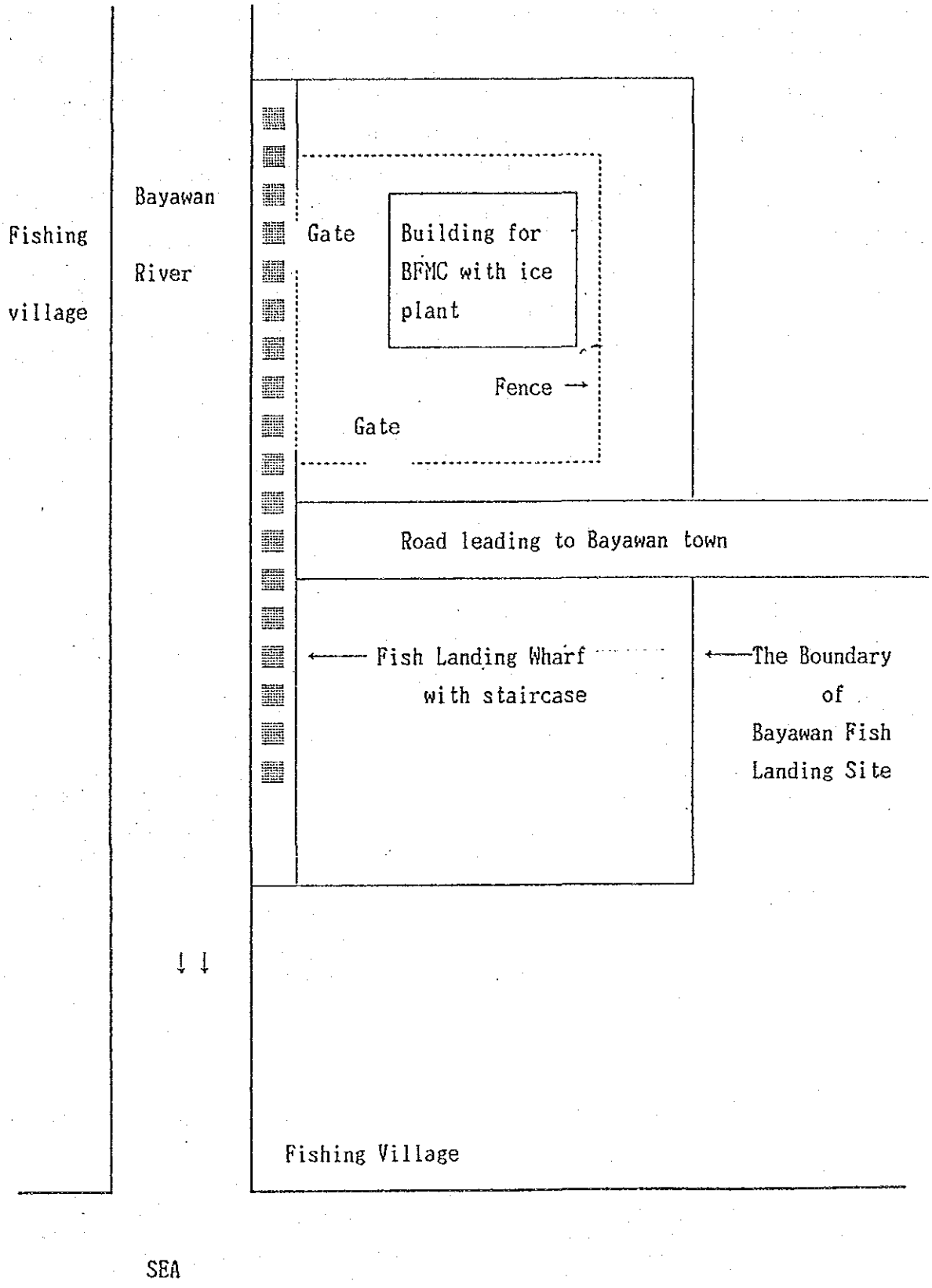

Figure 2 Bayawan Fish Landing Site

ii. BFMC involved directly in risky fish marketing business

BFMC buys fish caught by the members and ships them to Dumagette by its own van for sale. As these fish are iced, the price of fish sold in Dumaguete is said to be some 20% higher than that of fish not iced. Nevertheless, there is a fear that BFMC is involved in risky business, as there is no guarantee that the price of fish sold in Dumaguete is always higher than the price by which BFMC purchased fish from the members. It would be most desirable that BFMC may act as a fish wholesaler to whom both municipal and commercial fishermen will consigne their catch for sale. In return BFMC will hold an auction for the sale of fish consigned by inviting fish dealers, middlemen, local retailers, etc. In this way BFMC can avoid any risk by involving in fish marketing by themselves. At the same time BFMC can ensure a continuous and stable income, as through such an auction the cooperative normally charge 3 to 4 percent of commission to the total sales value.

iii. Only a half of fishermen were the member of BFMC

By the time of our visit the number of municipal fishermen who were the members of BFMC was some 150, which was only a half of all fishermen in the area. The reason was that the remaining 50 percent of fishermen owed money to brokers or middlemen, and hence they had to sell their catch to them. This problem could be solved if BFMC adopts an auction system as suggested in ii above. By this way BFMC can repay to the middlemen on behalf of fishermen, as the middlemen are participants in the auction for the purchase of fish.

iv. Commercial fishermen were not allowed to buy ice from BFMC

For the past two months the CIDA ice plant at Bayawan was in full operation. According to its rule only municipal fishermen using a boat of less than 3 gross ton are eligible to be the members of BFMC. As their use of ice was limited, there were surplus of ice supply. During our stay at Bayawan we saw a commercial fishing boat of about 10 gross ton landing a good quantity of skipjacks. Strangely, neither ice was brought to sea with the boat nor ice was bought from BFMC for the shipment of the fish to Dumaguete, even though ice was available at cheaper price at BFMC. This contradiction could be easily solved if commercial fishermen are allowed to be associate members of BFMC, by which they are entitled to buy ice from BFMC.

v. BFMC should be a core in the development of fisheries as a whole in the area

Presumably BFMC is supposed to have been established as a core for all fisheries in Bayawan area, although it gives a focus to the development of small scale fishery. If this is an idea behind, BFMC should be entitled to make full use of the whole area of Bayawan fish landing site including a 70 meter long fish landing wharf. In other words, it would be most desirable that the management of all fisheries infrastructures be left at the disposal of BFMC. However, for the moment BFMC occupies only part of the site, which is strictly guarded by a fence made of barbed wires. Thus, it gives an impression to visitors like us as if BFMC is going to play only a minor role in the development of fisheries in Bayawan area. (See Fig. 2)

3. Fishery Cooperative as Management Body for IPCS System in the Philipoines

A physical plan for the Nationwide Ice Plants and Cold storages Network System (IPCS System) which was completed by a JICA study team is composed of (i) eleven (11) IPCS zones and (ii) forty nine (49) prototype IPCS sites, as indicated in Fig. 1. An IPCS zone has been established in the area where there will be a good demand of ice for the area as a whole, and it will be composed of a center with a relatively large size ice plant and cold storage and several sub-centers with ice storage only. In this way the center will deliver ice to the sub-center according to its requirement. On the contrary, the site for proto-type IPCS has been selected independently for each particular fishing port where a good demand of ice exists.

The present chapter deals with the management plan for IPCS System, which was not completed by the JICA study team. The chapter is primarily drafted based on the author's ideas together with what he has learned from his visit to Bayawan Fishermen's Marketing Cooperative. The whole ideas as illustrated hereunder have already been presented to Philippine Fisheries Development Authority (PFDA) for consideration.

3.1 Underlying Policy for the Management of IPCS System

i. Fishery cooperative is the most ideal management body for IPCS System

The government intention of providing ice plants and cold storages to municipal fishery is, among others, to raise the income of small scale fishermen, whereby their living conditions could be eventually improved. If so, a fishery cooperative which was organized with a full participation of fishermen in the area would be an ideal management body for IPCS System. Under no circumstance PFDA which is a government body like PFDA should involve in the management of IPCS, as there are many previous examples that BFAR which is also a government agency has failed in the running of ice plants granted by foreign countries.

ii. Management of IPCS will be merely part of the activities of a fishery coop

There should not be any single management system for IPCS alone, as the supply of ice is merely a part of the processes relating to fishing operation and fish marketing. It would be, therefore, most appropriate that the management of IPCS System be treated as a part of the overall activities of a fishery cooperative.

3.2 Definitions of Some Major Technical Terms

In the present chapter several technical terms as listed below are used with the definitions as illustrated below.

Fishery co-operative (FC) is a leagal body organized by municipal fishermen who are usually economically weak, and it is a non-profit making organization to serve its members for their benefit. FC is also the most appropriate channel, through which all government services can be properly and effectively rendered to fishermen in terms of equity.

Municipal fishery (Small scale fishery) is the one which is performed with the family members of a fishing household for their livelihood. Thus, as long as a fishery is undertaken by the family members of a fishing household, it is regarded as the municipal fishery regardless of the size of fishing boat in use. In the present paper fishermen who engage in such a municipal fishery are regarded as municipal fishermen.

Commercial fishery (Industrial fishery) is the one which is performed with hired fishermen to pursue a profit.

(Note) In the Philippines a border of 3 gross ton of fishing boat is used for many decades to distinguish between municipal and commercial fisheries. This distinction is, however, no longer valid, as with the development of her fishery even municipal fishermen have often employed a boat of more than 3 gross ton.

3.3 Incentives for the Establishment of Fishery Cooperative

Ideally FC should be established with the motives of fishermen themselves rather than being enforced by the government. For doing so, it is advisable that the government may provide fishermen with certain incentives as outlined below:

i. A fishing property right may be granted to FC, as municipal fishermen, in many instances, consider fishery resources available in sea area right off their village as their own property. With a fishing property right so granted, municipal fishermen themselves may try to establish measures to conserve their own fishery resources. The fishing property right may also play a good role to eliminate a conflict with commercial fishermen who often invade their waters.

ii. In providing fishing port, IPCS and any other fishery infrastructure a top priority may be given to the area, where FC has already been established or will be surely established in the near future.

iii. It would be most ideal that fishery infrastructures being provided by the government may be granted to municipal fishermen, so that FC can make use of them as its own capital asset to initiate its activities straight away. If this is not possible, the construction cost could be shared by both the government and FC say by fifty-fifty on the condition that the cost to be shared by FC will be repayed by installment to the government say over 20 years with a grace period of say 5 years. In this way the government, in this instance PFDA, can retain an authority to guide and supervise FC with regard to the management of fishing port, IPCS, etc.

iv. The government may provide FC with a loan as the working capital at the initial stage of its operation if so required.

v. The government may also recruit, at its own expense, an executive manager and some key personnels including IPCS engineer to FC to initiate its activities. When the works of FC become normalized, however, they will be transfered to FC and their salary will be paid by FC.

vi. In providing fishery credit to municipal fishermen the government may also give higher priority to the area where FC already exists and is involved in fish marketing by means of auction. In this way the repayment of fishery loan will be ensured.

(Note) For the construction of fishery infrastructures in Japan the central government, the prefectural government and the municipal government share 40, 30 and 10% of the total construction cost respectively. Thus, FC has to share only 10% of the total construction cost.

3.4 Establishment of National Fishery Cooperative System

(1) Overall Structure of Fishery Cooperative System

The following structure may be envisaged:

i. Primary Fishery Cooperative (PFC) at municipality level.

At the initial stage PFA will be formed only for municipalities, where either an ice storage of IPCS zone system or a proto-type IPCS are provided by the government. However, in the long run PFC will be formed at every coastal municipality.

ii. Regional Federation of Primary Fishery Cooperative (RFFC)

At the initial stage such a federation will be established only for every IPCS zone with the office at its zone center, and the members will be PFCs established at the sub-centers. However, in the long run the federation will cover the entire area of either a province or a region which is a group of neighbouring provinces.

iii. National Federation of Fishery Cooperatives (NFFC)

At the initial stage PFDA will assist PFC and RFFC in the operation of fishing port, IPCS and any other activities. In the long run, however, a National Federation of Fishery Cooperatives will have to be established with the full participation of all RFFCs.

(2) Establishment of Primary Fishery Cooperative

Primary Fishery Cooperative (PFC) may be formed in accordance with the following conditions:

i. Fishery infrastructures as fixed assets to PFC

Fishery infrastructures provided by the government to municipal fishery are considered to be the capital asset of the PFC as illustrated in (iii) of 3.3 above.

ii. Only municipal fishermen are right members of PFC

Only municipal fishermen as defined in 3.2 above are eligible to be the right members of the PFC with the payment of a nominal membership fee of say 100 Pesos per person, which will be used as the working capital of PFC.

iii. Commercial fishermen can be associate members of PFC

Commercial fishermen may be allowed to be the associate members of PFC with the payment of their membership fee, so that they are also entitled to make use of various services from PFC like the supply of ice, fuel, water, etc. However, they may not be allowed to vote at the general assembly of PFC for certain bills, for which favourable conditions have to be given to the right members, e.g. the use of coastal fishery resources, allocation of subsidy specifically designed to sustenance fishermen and so forth.

iv. Under no circumstance persons other than fishermen can be PFC's members

Under no circumstance non-fishermen are allowed to be any sort of the member of PFC, as the present level of catch is already within the reach of maximum sustainable yield.

v. Fish dealers, fish retailers and fish processors are allowed to attend PFC's fish auction through which they buy fish

Local fish dealers and fish processors may be allowed to attend auction to be held by PFC with the payment of a certain amount of deposit to the PFC. In this way they are entitled not only to buy fish through PFC auction but also to make use of PFC's facilities.

vi. Fishery infrastructures as capital assets and membership fees as working capital of PFC

Above all the total capital invested to PFC will be fixed assets, i.e., fishery infrastructures constructed at the expense of both PFDA and PFC, and the membership fees paid by both right and associate members will be the working capital of PFC.

(3) Establishment of Federation of PFCs at IPCS Zone Center

A Federation of PFCs (RFFC) at local level may be established, in the first instance, for each IPCS zone in accordance with the following conditions:

i. FPFC will be a legal body to act as fish wholesaler at the IPCS zone center in addition to the management body of IPCS.

ii. It is assumed that IPCS at the zone center was constructed jointly by PFDA and PFCs established at the IPCS sub-centers by sharing the cost by fifty-fifty. Therefore, the cost assumed to have shared by PFCs will have to be repayed to the government by installment.

iii. RFFC will be formed with the participation of three parties; (1) PFDA, (2) PFCs concerned and (3) local fish dealers. For the formulation of such a federation both PFDA and PFCs will invest IPCS and related facilities as capital asset, while fish dealers will invest in cash which could be used as the working capital of RFFC.

(4) Role of PFDA at National Level

PFDA will act as a central core to guide and supervise the works of FPFC and PFC in close colaboration with Bureau of Fisheries and Aquatic Resources, Bureau of Cooperative and any other related organizations. The detail of its functions will have to be carefully studied and determined in accordance with the outcomes of further studies.

PFDA has already commenced the management of some IPCS transfered from BFAR. It is, therefore, advisable that by selecting one or two of these existing IPCS sites a pilot study be made to gain actual experiences with respect to the following two aspects:

i. To establish a Primary Fishery Cooperative along the lines as envisaged in (2) of 3.4, and

ii. To run fish marketing along the lines as envisaged in (2) of 3.4 with the use of existing IPCS.

4. Conclusion

Last all it should be reiterated that as already suggested earlier there should not be a single management system for IPCS System alone. Rather the management of IPCS System should be treated as merely part of the overall economic activities of a fishery cooperative.

A table at the next page gives a summary account of economic activities of Japan's fishery cooperative as a whole. The table clearly reveals that fish marketing business through auction is, among others, the most important income source of a fishery cooperative considering the size of amount transacted. On the contrary, the table indicates that the operation of ice plant and cold storage is merely a minor business of a fishery cooperative, which often gives a red figure to them.

Economic Performance of Marine Fishery Cooperatives in Japan, 1980.

Type of Business performed by Coop.		Number of Coop. Involved	Average Amount Transacted per Coop. (Million Yen)	Number of Coop. gained Profit out of total number of cooperatives (%)
Total No. of Coop.		2,155		81%
Fish marketing		1,760	854	73%
Credit	Saving	1,697	681	42%
	Loan	1,780	467	
Sale of Fuel etc.		1,786	161	42%
Ice Making		526	21	24%
Cold Storage		729	71	

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Real Development of Fishing Industry

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There are three elements to be considered for the real development of fishing industry ; viz.

(1) **Technological Renovation of Fishery**

to increase the size of fishery production through capture and aqu-culture

(2) **Development of Fisheries Infra-structural Facilities**

with an Emphasis to the Provision of Fishing Harbour and Fish Marketing Facilities at both Fish Landing Centers and Fish Consumming Areas

(3) **Consolidation of Fisheries Institutions**

with respect to Fisheries Management including Related Research, Fishermen's Organisations like Fishery Cooperative, Fishermen's Association, Fish Marketing System, Fisheries Credit System , Fisheries Insurance Scheme and so on.

With an exception of aqua-culture a very little attention is required for the technical renovation of fisheries, as there is not much room to increase the size of fisheries production due to over-exploitation of fisheries resources. Rather sea ranching by releasing the youngs of high valued species to sea may be required with the initiative of the government at its initial stage.

Development of fisheries infra-structural facilities like fishing harbour and fish marketing facilities including ice plants and cold storages is a task, for which the government should pay the top priority for the real development of fishing industry. These facilities will improve the quality of fish caught by fishermen and hence result in better price to fishermen. At the same time, the provision of these facilities will give incentives to fishermen to establish their own organization.

Every government has a national fishery office which is called Fisheries Department, Bureau of Fisheries, etc. The role of the national fisheries offices is to render various services to fishing industry and fishermen. Fisheries institutions which are normally defined by fisheries laws are absolutely required to keep the fairness of goverment services to fishing industry and fishermen. This is particularly so for fishery management to keep the order of fishing operation between different groups of fishermen and also to conserve fisheries resources. For the implementation of the fisheries management scheme fishermen's organisations established for each different groups of fishermen are absolutely requireed as instruments through which the government services can be effected.

In those days, in many countries, reduction in the size of fishing fleet for industrial fishery is required to ease over-exploitation of fisheries resources and to eliminate a coflict with small scale fishery. Reduction in the number of small scale fishermen is also required to improve the productivity of fishermen.

In relation to the above guidelines some additional lectures will be given hereunder refering to the facts appeared in Japan, Philippines and Indonesia.