

Preliminary Study Report on the
FISHING RIGHT PILOT PROJECT
in
Bang Saphan Bay, Thailand



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Southeast Asian Fisheries Development Center

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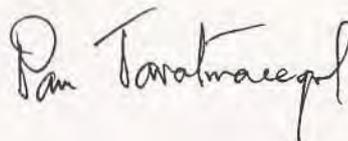
PREFACE

The situation of coastal resource decline and conflict among fishermen fighting for resources indicate the need for management in the coastal fishery sector. There has been a big effort by the Government to control fishing effort through enforcing fishing restrictions in the coastal areas, at the same time increasing marine resources by releasing juveniles of the marine resources. It can be said that this has not been successful, because most of fishermen using the resources apparently still do not understand the concept of sustainable utilization of marine animals. They still want take as much as possible and do not care about the future. Open access to the resources creates conflict between fishermen and presents an opportunity for highly capitalized effort to capture more resources than others. There are not many projects that consider involving resource users in the management system. Management for coastal fisheries not should only concern natural resources, but should also take account of the people using the resources. They should play a major role in these, they should have the right to fish and have the authority to manage the resources. It is easy to say "grant fishing rights" and decentralize the authority of government to fishermen, but to make it work will need long term effort by the government and local people to work together to solve the difficulties. The framework of coastal fishery management is composed of many elements; legal, social, economic, local institutional and administrative.

The Thai Department of Fisheries has implemented the Coastal Fishery Management Project (Fishing Right Pilot Project) in Bang Saphan Bay, Prachuap Khiri Khan, Thailand. The Pilot Project aims to grant rights to the fishermen in the project area in the near future. This will be a most exiting experiment since it will be a distillation of many ideas from local community through government and technical expertise contributed from all those with an interest. The type of fishing right suited to the project area is not yet decided and the local institutions that should take responsibility for the management of the project, and who should be granted the right are not yet defined. It is necessary for them to set up regulations as well as manage fishery resources and the roles of Government in the project should be defined. It is expected that that the successful implementation of the project will not only benefit Thailand, but will also benefit other countries in the Southeast Asian Region who are looking for the better management system for their Coastal Fishery sectors.

This study could only have been completed with the great cooperation extended by the local fishers and administration officers of the Department of Fisheries in Bang Saphan and Bang Saphan Noi District, Prachuap Khiri Khan Province, Thailand. It might be possible to develop basic ideas using only literature reviews, but without their opinions and discussions, undoubtedly the outcome would not been able to form such a practical content as those presented herein. It is expected that this study will help to resolve the present anxiety of the fishers on coastal marine resources and provide answers to their efforts to protect the resources on which their livelihoods have traditionally depended.

Our deep and grateful appreciation is herewith extended to all that have been involved in this study.



Panu Tavarutmaneegul

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CHAPTER 1 INTRODUCTION

1.1 Contribution of Fishery Sector to the Southeast Asian Region

The contribution of fisheries sector to food security, employment and income is recognized worldwide. Globalization is manifested in the fisheries sector through expanding trade, a greater reliance on market forces in policy-making and a very rapid increase in the amount and international mobility of private investment capital. One concrete result is that growth in the demand for fish products, no matter where it occurs, may affect fish production anywhere in the world through the mechanisms of foreign private investment and/or trade.

It is estimated that between 15 and 20 percent of all animal protein comes from aquatic sources. Fish is highly nutritious and serves as a valuable supplement in diets lacking essential vitamins and minerals. The world's oceans, lakes and rivers are harvested by artisanal fishers who provide vital nourishment for all communities, not only in Africa and Asia, but also in many parts of Latin America and islands in the Pacific and Indian oceans. Of the 30 countries most dependent upon fish as a protein source, all but four are in the developing world.

Not only is fish a vital food, it is also a source of employment and money for millions of people around the globe. In 1996, an estimated 30 million men and women were deriving an income from fisheries. An overwhelming majority of them - some 95 percent - were in developing countries.

In Southeast Asia, fisheries development is an integral part of the countries' economic and social development plans. The general policy objectives regarding the development of the fisheries sector are to increase fish production, to ensure food security and to increase employment, income and export earnings.

The marine and coastal waters of the Southeast Asian Region are one of the world's most productive regions. The region constitutes a rich area in which shallow water marine plants and animals reach a peak of species diversity. This diversity is associated with the very high production of organic matter, which in turn is converted into high fishery yields. Coastal ecosystems such as upwelling areas are capable of producing over ten times as much organic matter per unit time as offshore waters. This very high production of organic matter is transformed into a tremendous variety of economically valuable products used by the people in the region.

Marine fisheries of the Southeast Asian region are characterized by the use of multiple type of fishing gear by a large number of small-scale fishermen, estimated at more than four million, to exploit a large number of fish and other aquatic organisms. However, since the sixties, fishing pressure has been increasing particularly in coastal areas, this has led to the depletion of fishery resources, conflicts among the users of the resources, etc. In addition, the United Nations Convention on the Laws of the Sea (UNCLOS) 1982 declared a new management regime of 200 NM of the Exclusive Economic Zones

(EEZs) over which coastal states have national jurisdiction.

There have been efforts made for the development of management schemes to effectively develop the fisheries sector particularly the coastal areas. However, the existing problems and constraints mentioned above have become even more critical. This may be due to the unsuccessful management regime of open access in developing the sector. It is expected that using a fishing rights system under community-based fisheries management through the strengthening of fisher's groups may offer a better solution to properly manage the fishery sector particularly for coastal fisheries.

1.2 Problems and Constraints of the Coastal Fisheries Situation in Southeast Asia

Changes in the supply, demand, values, management and use of fisheries resources could threaten progress towards sustainable food security and coastal fisher's well being in the region, but these changes could also demand improved management and use of the resources. Appropriate modern methodologies to manage the coastal and small scale fisheries have received scant development, as the scientific approach on fisheries management has been mainly developed in temperate regions where the coastal fisheries sector are minor segments. The majority of the currently available fisheries management methodologies are aimed at managing the industrial fishing fleets catching the resources of offshore waters. It is also obvious that there will be no single methodology to effectively manage coastal fishers. These are rooted in localized socio-economic and cultural factors in complex ways. Due to the lack of valid methodologies, decision makers have avoided becoming involved in the issue of management of coastal fisheries by justifying to themselves that the small scale fisheries sector are socio-economically important, and are therefore waived from Government action to control them. However, such special arrangements have eventually deprived them of Government care. It is also true that decision-makers have been searching for better ways of managing all fisheries.

In the Southeast Asian Countries, a major proportion of the fisheries sector is categorized as small scale and that coastal fishery contributes greatly to local food security. It is imperative for SEAFDEC to initiate action for the management of this sector. Due to the increasing trend of such coastal fisheries sectors in terms of numbers of people involved and fishing effort, it should be noted that the coastal resources situation will be further degraded unless appropriate action is taken as soon as possible. Without having a proper management system along the coasts, small scale fishers may have to employ more effective and destructive fishing gear for harvesting the fisheries resources for their survival. Such action will eventually destroy the coastal resources including juveniles of commercially valuable species and lead to the further marginalizing of their economic situation now and for future generations.

Many present coastal fisheries management arrangements at country level generally fail to accommodate the needs of the many, but different users, leading to depleted resources and conflicts. Although many individual countries in the region struggle for better fisheries management under their national sovereignty, the pace of progress is very slow. Since many socio-economic factors and characteristics of fisheries are regionally common, even though many local specific problems exist, a regional approach by

exchanging national knowledge and experience and mobilizing regional wisdom may well be a cost effective mechanism to solve common problems. Such regional mechanisms and a created framework for coastal fisheries management may greatly facilitate the required action at national level in individual countries. It is therefore proposed that SEAFDEC should have clear views of the problems and approaches to tackle those problems in order to initiate a Program on the Management for Sustainable Coastal Fisheries in Southeast Asia (MSCF).

1.3 The Search for Better Regional Management Approaches

Experts in fisheries management recognize that the underlying causes of fisheries resource over-exploitation are often of social, economic, institutional and/or political origin. It is also known that land-based and up-stream activities create much of the coastal environmental degradation. Fisheries management in many countries has been heavily influenced by the Temperate Zone's scientific model of calculating maximum sustainable yield of a few key fish species and the need for a centralized administrative authority. This model has been shown to have a limited application in multi-species-gear tropical fisheries. It also provides for little or no effective consultation with, or participation from, fishers. As the current indicators showing the extent of exploitation are limited in access only to scientific levels, there is no way for the fishers to understand the extent or potential of the resources, which such indicators show.

Although fishers' participation in management can provide a wealth of indigenous knowledge to supplement scientific information, to help monitor the resources and improve overall management, such arrangements have scarcely materialized in the coastal fisheries sector. However, many management approaches, externally formulated, have been applied to different local specificity. By using these approaches, the existing structure becomes obscured, less local resources and competency are used; and dependency on external inputs is higher. In short, an approach to fisheries management must be carefully tailored for the situation of the locality where it is to be applied.

National government fisheries managers are now recognizing that fisheries cannot be managed effectively without the co-operation of the fishers. Under these conditions, certain delegation of fisheries management authority to the local fishers and community level may be more effective than the government management efforts which are distant, understaffed and under-funded.

1.4 Fishing Rights under Community Base Fisheries Management and Co-management

The fishing right is suggested as one measure to manage coastal fishery resource and is a conclusion of the IPFC Symposium, 1987. As cited by Somying Piumsombun, at the 1994 IPFC Symposium, this concluded that *"Although there are various techniques for controlling excess (fishing) capacity, it seems that the two techniques most relevant for Southeast Asia are the decentralization of management authority to local fishermen groups as for example, through territorial use rights in fisheries (TURFS), which are*

generally more suitable for small-scale fisheries, and the limitation of fishing units through a licensing system, generally more suitable for large scale fisheries”.

It usually conducts under the community base fisheries management or co-management system. Many definitions are given to the meaning of fishing right, some consider fishing rights as a property right, territorial use right or the right to fish. It is depend on the fishery background, policy and law of those countries.

Community-base fishery management efforts in fisheries are in an initial development stage. This is due in part to the complexity of coastal and marine resources systems as well as the social structure of fishing communities. CBFM starts from the premise that local people have the ability and capacity to manage the fishery resources. CBFM also includes effectiveness and equity as well as to be more economical in terms of administration and enforcement than national centralized systems. CBFM provides a sense of ownership over the resource making the community responsible for long- term sustainability of resources. CBFM cannot be successful on it's own. Government must support and work together with local fishermen on community based fishery management. This may be called co-management where the government and community share roles and responsibilities.

In the Regional workshop on Coastal Fisheries Management based on the Southeast Asian Experience, organized by SEAFDEC in 1996; it was concluded that the participatory approach must be given a high priority in coastal fisheries management. It also pointed out that community-based fisheries management can be developed and successful only when fishers understand that the fishery resources are owned by them. Granting fishing rights to fishers, and a limited entry scheme would be the best opportunity for them to establish their own organizations.

1.5 The reasons for selecting the Fishing Right Pilot Project in Bang Saphan Bay as a SEAFDEC case study

As mentioned in the SEAFDEC strategic plan, one of the new directions of SEAFDEC is to promote sustainable management for coastal fisheries in the region during the coming years. Community-based fishery management may not be new to the region in some aspects, but the fishing right system is considered as an initial step for all countries in the region. SEAFDEC is looking for systems that may be appropriate for all countries in the region. Even if fishing rights systems have been successfully conducted in Japan, the adoption of these systems locally needs study and analysis for the local situations in the countries. Within the same country the type of fishing right or the regulations supporting the system may differ from place to place.

Without the concern and initial action of any country in the region, it will be very difficult or impossible for SEAFDEC to study the fishing rights system. Using only literature reviews is not enough for SEAFDEC to give any suggested action to the member countries for an appropriate system. It is a good and timely opportunity for SEAFDEC that the Thai Government is considering initiating a fishing rights pilot

project in Bang Saphan Bay. The project is taking several years to move from step to step as it is going to need support from the many sectors concerned.

1.6 Study framework

1.6.1 Study objectives and framework

The fishing right system is one of the measures to achieve the rational utilization of the coastal fishery resources and is expected to be an effective tool for the fishers and administrators who implement community-based fishery management. The system gives fishers exclusive rights to catch and take care of the fishery resources in a demarcated area.

In Japan, due to its exclusive nature, the fishing gear allowed for use under the fishing right has been limited to only fixed gear. This may, or may not be, applicable in the case of Thailand. In the management of the fishing right system, in Japan, fishery cooperatives (FCs) have played a key role. However, under the different social and historical background in Thailand, the FC may be replaced with other community institutions, like fisher groups. However, some conflicts between fishers in respect of the use of resources in the vicinity may be predicted. These conflicts can be fatal to preserving the fishing rights in some cases. In order to establish the fishing right as a main measure for CBFM we need to know what conditions the system requires so that it can work as expected.

At the study site in Bang Saphan Bay, Prachuap Khiri Khan Province, Thailand, a pilot project was started in 1995 by the Upper Gulf of Thailand Marine Fishery Development Center of the DOF. During the last five years, DOF and the provincial fishery office have tried to implement the initial steps of the fishing right system in the Bay. This was done by educating the fishermen on resource management and by the banning of destructive fishing gear in the area covering the Bay and the waters in its vicinity. However, the implementation of the essential part of fishing right system cannot be easily decided from the scientific, social and economic standpoints. Several questions must be answered before achieving this step, what type of fishing right should be applied in this area? To whom should government grant their authority? What kind of support will help the fishing right to achieve the goal of sustainable coastal fisheries management? From the beginning of this project, the study team aims to get information and data on the actual situation of the fishermen and their utilization of the fishery resources. Also, what the administration and local fishers expect from the fishing right system in connection with CBFM and how they have tried to shape it since its launch.

Firstly, during the field study and since this project has already started, we need to have the primary information in order to have a better understanding on the present status of the relevant DOF projects and the fishery sector in the project site (see information in Chapter 2). After analysis of the collected data, our study will focus on the previous steps at the site to implement the fishing right system to evaluate its contribution to the fishery management. From that point, we will return to our original question given as

“What conditions this system requires so that it can work as expected?” Before full activation of the fishing right, we presume that the following four issues were clarified.

1 What kind of fishing right will be applied in Bang Saphan Bay?	Who, depend on the site marine resources? In which way and how much of these resources are utilized? Should all the marine resources be covered by the fishing right? Should the fishing right be based upon type of gear or methodology used, or on the type of marine resources?
2 Can the central government administration sector take the initiative?	To give fishers the exclusive rights, legislation or amendment of the relevant law and regulation is required. At what administrative level should such a consensus is generated? Furthermore, any obstacles that may be foreseeable in the legislation, for example, pressures from the industrial sector? What kind and what level of authority should be granted to fishermen?
3 What conditions fisher groups need to manage the fishing right?	What knowledge must the fisher groups have to manage the fishing right? What type of organization is suitable? What levels of expertise are available in the fishers group? What support is essential for them, and consequently for individual fishers to sustain their activities in the fishery sector?
4 This fishing right system will prevent other communities from fishing at the site. What will be the adverse effects?	If conflict is unavoidable, how it can be ameliorated by the administration and fishers themselves?

To clarify the above issues, the following objectives are set for the field study.

- 1) Status of the fishery resources in demarcated waters and their utilization
- 2) Current problems and conflicts on utilization of the resources
- 3) Possible measures for amelioration of the problems
- 4) Roles and responsibilities of the fisher groups and their institutional capability
- 5) Possibility of joint marketing by a fisher group

1.6.2 Study methodology

A study team of one Japanese expert, one researcher and one assistant researcher is envisaged. Interviews according to the survey checklist, see Annex 7, were conducted for 9 days, on 8 February, and between 1- 8 March 2000. The targeted interviewees were project officers; the manager, the leader, staff and patrol officers and fishermen,

see list of interviewees in Annex 2. Data and information were recorded as individual notes but after the interviews were finished each day, the study team compiled the information together in order to cross check and to define any doubt or any missing information. These were listed for questions for the next day. Final information was recorded in the form of descriptions and geographical information, especially the location of fishing villages, fishing grounds and visible objects was provided by the DOF, see Annex 5. The results of fishers' interview were described according to the answers by fisher's groups and followed the interview schedule, see Annex 1. Information from project officers is described under "fishery administration", Chapter 2. para. 2.3.

The general statistical information for Prachuap Khiri Khan Province is provided by the National Statistics Office and is mentioned in Chapter 2. para 2.1.

Analysis of the results of the study will be based upon the actual situation and problems, and literature reviews on related issues, namely the existing fishing rights system in Japan, SEAFDEC policies and roles in management for sustainable coastal fisheries in Southeast Asia, community-based fisheries management and co-management and fishery cooperatives.

At the conclusion of this study, we will propose a fishing right system which we expect to suit to local conditions of the project area and also the necessary Policy, law and regulations to support the project. For Southeast Asia as a whole, some technical aspects to build into the SEAFDEC strategy on CBFM projects in relation to the fishing right will be defined. We intend to prepare concepts of the types of project engineering that are generally required to have in overall view when implementing fishing rights systems in the various fishing communities having different social and economic conditions.

CHAPTER 2 PROJECT BACKGROUND

2.1 The socioeconomic background of fishery communities

2.1.1 General socioeconomic status

The Prachuap Khiri Khan Province of Thailand is located in the middle of the Malay Peninsular and its coast faces to the East on the Gulf of Thailand. The provincial population in 1998 was 473,335. GPP (gross provincial products) of this province at current market prices were 29,554 million Baht in 1996, and ranks 15th among the 76 provinces in the nation. GPP per capita of the province was Bt.57,786. The main industry is agriculture and fishery. Crops, livestock, forestry, and agricultural processing products contribute 4,650 million Baht (16% of total GPP in the province), while the fishery sector contributes 2,811 million Baht (10%). The working population in 1998 was 242,093, among which 122,075, or almost half, work in the primary industry. The average household monthly income in the province was Bt.10,017 in 1998. Income from agriculture and farming was Bt.7,411. Though there is no available data for fisher household income, since fisher households are classed as agricultural, these data on average incomes suggest a level of fisher income. For the details of socioeconomic statistics, refer to the Table A.1 to A.5 attached in Annex 3.

Prachuap Khiri Khan Province comprises 8 districts (*amphoe*). Bang Saphan and Bang Saphan Noi District are located in the southernmost area in the province. The district population in 1999 was 69,245 in Bang Saphan and 33,847 in Bang Saphan Noi. Bang Saphan comprises 7 sub-districts (*tambon*), among which two sub-districts face the sea. Bang Saphan Noi comprises 5 sub-districts, among which three sub-districts face the sea. The project site of the fishing right pilot project by the DOF covers two sub-districts of Bang Saphan District and three sub-districts of Bang Saphan Noi District. The population and number of household of these five sub-districts are given in the following Table 2.1.

Table 2.1 Population and households in the project site (April 2000)

Districts	Sub-districts	Male	Female	Total	Household
Bang Saphan	Mae Ramphung	3,057	3,087	6,144	1,996
	Phong Prasart	-	-	-	-
Bang Saphan Noi	Park Prake	1,601	1,558	3,159	849
	Sai Tong	3,583	3,461	7,044	1,789
	Bang Saphan	4,127	3,983	8,110	1,957
Totals		12,368	12,089	24,457	6,591

Source: <http://www.moi.go.th>

The sea in front of the five sub-districts and Bang Saphan Bay is formed with a cape called Mt. Mae Ramphung at the Northern end with Mt. Ban Kood in the South. There are three small islands in the bay which has a concave coastline between these two landmarks. The Bay opens into a mouth towards the Gulf of Thailand. The slope of the sea bottom is generally not steep except on offshore side of the cape and islands. Water depth in the center of the Bay is around 10 m, and 20 m or less outside the bay.

2.1.2 Fishery sector in Bang Saphan Bay

(1) General Information

To prepare for the pilot project, the DOF conducted a fishery survey¹ at the project site between 1997 and 1999. The survey included the general information and fishery structure shown in the following tables. The marine capture landing volumes are also included in the survey, though the catch data is under compilation and not yet available, as of March 2000.

The fishermen's ages ranges from 16 to 63 years old. 100% of the fishermen in the project site are male. Although a female fisher was observed engaged in fishing onboard a small-scale boat, but this is rare.

Table 2.2 Age of the fishermen

Range of fishermen ages	Percentage (%)
12-22 years old	6.8
23-33 years old	40.4
33-44 years old	29.02
45-55 years old	18
55-63 years old	5.6

Source: DOF, 1999

The educational background is primary and secondary school, 6 years in total, of compulsory education.

Table 2.3 Educational Background

Level of Education	Percentage (%)
Primary school	54
Secondary school	31.1
Pre High school	10
High School	2.5
Other	2.4

Source: DOF, 1999

Other = no education, certificate, diploma, bachelor degree or higher

Table 2.4 Marital Status

Marital Status	Percentage (%)
Married, stay together	76.4
Married, but separated or divorced	2.5
Single	20.5

Source: DOF, 1999

¹ "Project Documents: Coastal Fishery Management Project (Fishing Rights), Bang Saphan Bay – Bang Saphan and Bang Saphan Noi, Prachuap Khiri Khan", October 1999, DOF

Table 2.5 Social Status

Position	Percentage (%)
No position	97.5
Sub district or village Committee	1.9
Leader of Sub district or village	0.6

Source: DOF, 1999

Table 2.6 Religions

Religions	Percentage (%)
1. Buddhism	98.1
2. Islam	1.9

Source: DOF, 1999

(2) Fishery Information

The fishermen in the site are generally using 2 or 3 types of fishing gear throughout year, depending upon the fishing season. Their fishing grounds are mostly within 3 km of the shore. Apart from the monsoon season, they can fish throughout the year. More than 80% of the fisherman are engaged in small-scale fishery, using small size fishing boats equipped with long-tail outboard engines or inboard engine of a smaller horsepower. As shown in Table 2.7, around 17% of the fisher households are engaged in anchovy and squid luring light cast net operation, using larger boats of 14-16 meters in length, equipped with inboard engines of greater horsepower. This is classed as semi-commercial fishery in this study report. About 3% fishermen are of commercial scale fisheries (trawlers and anchovy purse seine). Fishing methods are classified with the fishing villages used.

Table 2.7 Fishing gear used (unit: household)

1.	Anchovy purse seine	10
2.	Luring light squid cast net	110
3.	Luring light anchovy cast net	71-21
4.	Beam trawler	8
5.	Fish gill net	175
6.	Shrimp gill net	148
7.	Bottom swimming crab gill net	208
8.	Squid trap	68
9.	Shell diving	8
10.	Chinese purse seine	7
11.	Hook and line	10
12.	Others	12

Source: DOF, 2000

Note: Most fishermen operate more than one type of fishing gear.

Fishery is the main source of income. 33.5% of all the fishermen earn income from other sources; namely, coconut cultivation (26%), laboring work in general (24%), farming (16%), construction laboring (14%), merchant (12%), transportation service (4%), tourist boat driver (2%), and fishing laborers (2%). It should be noted that the following Table 2.8 includes whether engines are outboard or inboard engines, and they are not classified by small-scale or larger scale fishing boats. However, there

seems to be some tendencies towards a difference of income level between these two.

Table 2.8 Fishing boats and monthly fishery income

Type of Boats	Percentage	Income (Bt.)
Long tail engine, with 5-10 PS, 4.6-6.8 m length	50.3%	3,000-12,000
Inboard engine, with 10-250 PS, 6.8-14 m length	40.7%	7,500-35,000

Source: DOF, 1999

70.8% of the fishermen are in debt to the many sources available in their district or fishing village. As mentioned above, 33.5% of the fishermen have side income mainly from agriculture and laboring work. Those who have mortgages are able to get loans from commercial banks. We noted that debt from middlemen shows an unexpectedly lower ratio. During the interview with a fisher group, it was mentioned that all the members are in debt, in the form of either cash or fishing gear, to the middlemen.

Table 2.9 Debt of Fishermen

Source of loan	Percentage(%)
Bank for Agriculture and Cooperatives	23.5
Relatives or Neighbors	23.5
Middlemen	16.0
Other banks	9.2
Others	27.8

Source: DOF, 1999

The amount of debts of fishermen who operate long tail boats are around 5,500 to 7,000 Baht and, for those who operate boats equipped with inboard engines, the amount of debt is around 65,000 to 125,000 Baht.

Table 2.10 Attitude of fishermen towards fishery resources and fishing right system

Issues	Percentage(%)
1. Fishery resources are very important to them	98.8
2. Do not want to change to other occupations	73.9
3. The following fishing gear causes decline of the resources	
a) Dynamite	96.3
b) Cyanide	95.7
c) Trawlers	93.2
d) Push nets	91.9
e) Lure light purse seines	85.1
f) Fishing with small mesh sizes	82
g) Lure light fishing	59
Fishermen's Suggestion: These types of fishing gear should not be operated within 3 km of the shore.	
4. Trawlers damage the small-scale fishing gear	85
5. Amount of catch is declining	93.2

6. If fishery resources continue to decline at this rate, in the next 13 years fishing cannot be operated.	99.4
7. Have got information on the Fishing Rights System	75.8
8. How did they get information about Fishing Rights?	
a) fishery officers	77
b) neighbors/relatives	1.2
c) others	21.8
9. On the concept of the fishing right; fishermen will have their own fishing grounds and will have roles to play in taking care of fishery resources. They will establish a fishers' group, identify the conditions of getting fishing rights and accept the government law to protect and control of the utilization of fishery resources in the coastal area.	
a) Agree with the concept	73.6
b) Do not agree with the concept	25.5
c) Don't know	0.9

(3) Fisher groups

There are 9 fisher groups at the project site; 3 fisher groups in Bang Saphan District and 6 fisher groups in Bang Saphan Noi District. The names of the groups and villages are shown in following table.

Table 2.11 Fisher groups in the project site

Name of Fisher Groups	Village No. and Sub-district	District	House-holds
Ban Park Klong Bang Saphan Noi	Moo 3, Bang Saphan	Bang Saphan Noi	67
Ban Nong Samed	Moo 10, Bang Saphan	Bang Saphan Noi	30
Ban Park Plak (Ban Kake)	Moo 5, Pak Plak	Bang Saphan Noi	30
Ban Chai Tha Lay	Moo 3, Sai Tong	Bang Saphan Noi	30
Ban Phang Dang	Moo 4, Sai Tong	Bang Saphan Noi	37
Ban Bang Berd	Moo 5, Sai Tong	Bang Saphan Noi	70
Ban Ao Yang	Moo 3, Mae Ramphung	Bang Saphan	55
Ban Pak Khlong Bang Saphan	Moo 5 Mae Ramphung	Bang Saphan	51
Ban Park Pid Fai Tha	Moo 1, Pong Prasart	Bang Saphan	36

Source: DOF, 2000

2.2 Coastal fishery resources and fishing activities

2.2.1 Status of fishery production

It is generally believed that Bang Saphan Bay and the coastal waters in its vicinity have a remarkable abundance of marine fishery resources. There have been no resource studies to evaluate the coastal fishery resource in the project area, as far as we know from results of our search. Meanwhile, it is well known that, in the broad waters off the southern coast of Prachuap Khiri Khan Province, there exists one of the spawning areas

of the Indo-pacific mackerel and anchovies² in the Gulf of Thailand. In the waters off the province, there also exists some of fishing grounds for small tuna, squid and other pelagic and demersal fish species. As noted by a district fishery officer, the abundant fishery resources of the Bay appear to be due to the favorable natural conditions of the Bay; that is to say, concave coastal line and three islands to within the bay, occasional rocky bottoms and coral reefs, and five channels flowing into the Bay transporting nutrient salts from the land.

Based on the abundant resources, some 400 small and middle size fishing boats are presently based on the coast of the Bay, and are engaged in fishery production inside the Bay or the waters in its vicinity. According to a fishery study³ made by the DOF, the majority of fishermen are engaged in gillnet and trap fishery, and around 90 fishing boats among 365 fishing boats, (25%), are estimated to be engaged in larger-scale fishing methods; that is, purse seiner, trawler and some cast net boats. Fishery production statistics covering the project site were not available as of March 2000, although the catch data is being prepared by the district fishery office.

Other than concrete piers built by the DOF, there are no public fishing port facilities in Bang Saphan and Bang Saphan Noi districts. Most of the smaller fishing boats in the Bay are anchored in front of the beach without sheltered facilities, and in rough sea conditions like the NE monsoon season from October to January, the boats are moored in one of the channel mouths or in their upstream reaches or landed on the beach. Larger fishing boats are generally anchored at a landing site of Ao Yang where the cape Mae Ramphung Mountain gives a shelter from the NE wind in area behind it.

There are no shore based preservation facilities like cold storage and ice making plants for the use of fishing boats in the Bay. In the southern village of Bang Saphan Noi, a privately owned refrigerated container for ocean freighters was observed as the only instance. This we assume is used for the temporary preservation of fresh catch. In most of the fishing villages, insulated fish containers of 40 to 50 kg capacities are used by middlemen with ice to preserve fresh fish after buying from the fishers. On the northern side of the cape Mae Ramphung Mountain, there is a concrete pier of a larger size connected to a wharf and roofed handling space of steel structure, as well as preservation facilities. These are managed by private companies and are used only for their own fishing boats which include trawlers.

2.2.2 Utilization of coastal fishery resources

One of the main tasks of our interview was to know the geographical locations of the fishing grounds and fishing gear used in the area. On the project site, for very apparent reasons, interviewed fishermen were generally very knowledgeable and willing to advise us on the various particulars of their fishing grounds; their accessibility and the fishery resources available to them. It seemed throughout our interview that, without positioning instruments in mostly all the cases, fishermen well understand the position

² "Fishery Resources and State of Stocks Exploitation in the Waters of the Gulf of Thailand, East Coast of Peninsular Malaysia and Andaman Sea, SEAFDEC/TD, 1997

³ "Project Documents; Coastal Fishery Management Project (Fishing Project) Bang Saphan Bay", October 1999,

DOF

of their boats on the sea by watching the cape Mt Mae Ramphung and Tha-lu Island, both of which can be seen from everywhere in the Bay and its vicinity.

In Bang Saphan and Bang Saphan Noi districts, the main fishing gear used by local fishermen are; swimming crab gillnet, mackerel bottom or surface gillnet, squid trap, fish trap, squid cast net with luring light⁴, anchovy cast net with luring light, anchovy purse seine with or without luring light, Chinese purse seine, and trawls. As shown in the table 2-1 most of these have a specified aquatic animal name in their name, these fishing gear are intended to aim for a specific species, although some of these, like the swimming crab gillnet and anchovy cast net, also trap by-catch with or without commercial value.

In connection with the fishing grounds, we noted in all of our interviews that the fishermen at the project site deliberately operate fishing using specific gear in specific fishing grounds. From this, it seems that the fishermen well understand where and in which layer they can find the target species, which means that, when they cannot find some useful fish species in the Bay, it is probable because these resources have substantially disappeared. For such cases, we were given two examples of shrimp and Spanish mackerel by some of the fishermen as described later.

According to the results of our interview, the major fishing grounds inside the demarcated area under the fishing right project can be classified broadly into three geographical areas; north of the three islands that is enclosed by the cape Mt Mao Ramphung and the islands. In the vicinity of the islands, and south of the islands. The use of the grounds by the main villages in the project site, Bang Saphan and Bang Saphan Noi districts, can be summarized as in following table. It should be noted however, that this table does not cover the whole of the fishing activities in these villages and some parts are missing. For example the information of commercial scale fishery of Nong Samed and Fai Tha villages were not recorded because only the small-scale fishermen appeared for interview. These are as mentioned in the results of the interview attached in the annex 4.

Table 2-1. Local Users of Major Fishing Grounds in the Demarcated Area

Areas	Swimming crab gillnet	Mackerel gillnet	Squid cast net	Anchovy cast net	Anchovy purse seine	Others*)
North of the Three Islands	Ao Yang, Fai Tha, N-Samed, PK(S)	Ao Yang, Fai Tha, PK (N), PK(S)	Ao Yang, PK (N)	Ao Yang		PK (N), N-Samed
Vicinity of the Three Islands	Fai Tha, N - S a m e d, PK(S)	Fai Tha, PK(S), C-Tha Lay	PK(S), Ban Kake	Ao Yang, PK (N), Ban Kake	Ao Yang	N-Samed

⁴ "luring light": lighting device to aggregate fish school in the nighttime operation. In Thailand, in addition to incandescent lamp, fluorescent lamp of green color neon has come to be used recently for this purpose mainly to decrease generated power. Fluorescent lamp is usually used with smaller squid cast net boat that is thus called "Kra Sue", ghost emitting green light from its body.

South of the Three Islands	C-Tha Lay, P-Dang	C-Tha Lay, P-Dang, Bang Berd	PK(S), Bang Berd	Ban Kake, C-Tha Lay		P-Dang, Bang Berd
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Source: *the study team's interview in March 2000*

Remark: 1) Other fishing methods include squid trap, shrimp gillnet, fish trap, hook and line, and trawl. For the details, refer to fishing ground maps and results of the interview attached in the end of this report.

2) PK (N)=Pak Khlong Bang Saphan, PK (S)=Pak Khlong Bang Saphan Noi

From the above information, it may be noted that, other than Nong Samed and Pak Khlong Bang Saphan villages that have better access to both north and south of the islands, the northern waters are mainly used by the villages of Bang Saphan district, the southern waters by the villages of Bang Saphan Noi district, and the vicinity of the islands are used by both of them. Relative to this point, we stress the comment of a fisherman of Bang Berd that the waters beyond Tha-lu Island are too far for fishing, taking two hours using a long tailed OBM boat. The fishermen of Phang Dang, are also mindful of the fuel consumption of their fishing boats, when they say fuel consumption was 5 ltrs./day for trip to the previous nearer fishing ground has increased to 7 to 8 ltrs./day to the present nearest fishing ground.

Accordingly, we can note here that, so far as the small-scale fishing boats are concerned, an economic endurance, and the economically reachable navigational range of the boats, have affected the fishermen's access to the fishing grounds in the Bay, or have limited their fishing operation to within a certain range. This leads us to another point of view when we consider the small-scale fishing boats from the neighboring villages of the Bay. In response to our question on the acceptability of the outside communities fishing in the project area, a fisherman told us that it would be difficult for them to make a long trip to reach to this area. We feel this comment may be an essential aspect when we consider the demarcation of the waters.

2.2.3 Fish marketing

Most of the fishermen who were interviewed, with only one exemption of a young fisherman in Fai Tha, answered that they and other fishermen in their village sell their catch to a specific middleman, as they owe money to him or her. When fishermen need money to buy fishing gear or to prepare for some emergency case that has arisen in their family, they ask financial support from one of middlemen, who visits or lives in their village. The loan is made to fishermen in form of fishing gear or cash by the middleman. The loan is repaid by selling the catch to the middleman, who sets the price. The loan is made without interest but the catch is always valued at lower prices than at a reasonable level.

In this situation, the fishermen in the Bay have almost no choice in selecting a buyer for their catch. The extent of this limitation seems to depend on the relations between the fisherman and the middleman. In Nong Samed, the fishermen can sell only a small quantity of fish to their village neighbors or tourists, but they are not allowed to sell even a small quantity at markets or to other middleman. In case of Pak Khlong Bang Saphan Noi, it is possible to sell catch to the others. However, the fishermen simply do not sell even a small quantity to anybody other than their middlemen, as they think it deviates from the customary way. This difference between these two villages may be

explained from the aspect of a community based relationship, as the middlemen of Nong Samed come from other villages or towns, while the middlemen of Pak Khlong Bang Saphan Noi are residents in the village.

It is generally said in Thailand that, unlike the case of agricultural farmers, a bank loan service is not available to fishermen if they lack enough to guarantee the mortgage. Fishing boats cannot be used as mortgage guarantees. Presently the revolving fund assisted by the DOF is available to the group members and the fund is well utilized by them. However, the fact that loans by middlemen still play an essential role in the fisher's household management indicates that it cannot be replaced yet with the revolving fund. Some fishermen said the fund is not big enough for all the members to borrow from. Another fisherman in Ban Phang Dang commented that the burden of 2% monthly interest is heavy for them. He explained it by giving an example. If fisherman loses his new fishing gear bought by borrowing from the revolving fund, he can not apply for a loan from the fund again to buy another new one, as the repayment of two loans is impossible within overlapping time limits. In comparison with this, as repayment of the loan from middlemen does not include interest, a doubled loan results only in a prolonged repayment term.

To fill some gaps in public financial assistance, the middlemen have played undoubtedly a supportive role to meet financial needs in the small-scale fishery sector in the Bay, as well as to keep continuity in the marketing of fish. It should however be noted, that the present system of fish marketing deeply involving middlemen as a financier gives invisible advantage only to the middlemen and not to fishermen, for the reason that only the middlemen can handle the cash flow and hence may accumulate capital under such a system. It appears, in one aspect, that fishermen do not sell their products but sell their labor for "wages" on a commission basis, the percentage of which others decide.

To eliminate the above problem, the present fish marketing system should not be continued, and to set up this rather difficult task, some measures would be required to support the fishermen so that they may become own-account operators; that is to say, to introduce a joint marketing system in the communities. The DOF has the same concern, and early in 2000, they started a program to build a fish handling and processing plant behind the project office in Nong Samed. The facilities are planned for use as a central fish market for when joint fish marketing becomes possible. It was confirmed in our interview with fishermen in the Bay that they, some at least, have an awareness of the present system obstacles. A fisherman told us that he wished to be able to market his catch by himself. However, "though fishers can market around 20 kg of the catch, catches of more volume may not be sold. Furthermore, there are no measures to preserve fresh fish or to transport it. Thus, fishermen depend on the middlemen for fish marketing". This fisherman thus explained his awareness of the present situation.

2.2.4 Status and issues in fishery management

(1) Status of the fishery resources

As a fisherman commented during our interview, the fishermen believe that the Bay has many good fishing grounds, and the size of crabs is larger and fish qualities are better. However, many are also aware that the fishery resources have shown some negative signs for many years. The following fisherman's opinions on the status of the resources are drawn from the interview at Ban Kake, Chai Tha Lay, and Phang

Dang.

- 1) 15 years ago, the net length was shorter than at present and the fishing grounds were nearer. At that time, schools of Indo-pacific mackerel could be seen within 3 km of the shore and Spanish Mackerel could be caught near the three Islands.
- 2) In the case of fish traps, 15 to 20 traps per fishing trip gave enough catch to feed his/her family, but at present they use more than 100 traps per trip.
- 3) *Sai-mai*, (juvenile anchovy), have decreased when compared with the past. (6 years ago).
- 4) Spanish mackerel preys on the *sai-mai*. Since anchovy cast netting started, Spanish mackerel have disappeared from the northern waters of the Islands.
- 5) In previous days, the fishing grounds were the southern waters of the Island, and fishermen consumed only 5 ltrs. of fuel oil/day or less, but now fishermen have to go to further to offshore waters to fish and this consumes 7 to 8 ltrs./day.

As referred to in the above, indications of resource decline are explained in terms of the enforced increase of fishing effort, enlargement of fishing gear capacities or the increase of fishing times both of which result in increased cost, and a decrease or disappearance of indicative species including Indo-pacific and Spanish mackerel.

(2) Damage to fishing gear by larger fishing boats

As one of the main issues in fishery management in the Bay, the DOF has expressed concern over the problem of fishing gear damage to small-scale fishery by larger fishing boats. In most of our interviews, especially in the villages where small-scale fishery is dominant, fishermen repeatedly emphasized that their fishing gear was damaged or lost through the action of other fishing boats, mostly by larger boats using trawl nets or anchovy purse seines. In one village, all the group members have experienced such damage to their fishing gear. As mentioned in a previous section of this report, loss of fishing gear may present fishermen with a serious financial problem. At the least, it forces fishermen to meet considerable extra expenditure.

(3) Conflicts among the local fishermen

Supposedly, fishing boats from the outside cause fishing gear damage. Additionally, the Bay fishermen have conflict over fishing activities among themselves. Some fishermen engaged in small-scale fishery are aware that anchovy luring light cast net boats operated by some of the villages may catch juveniles of other fish than the targeted *sai-mai* because of its very fine mesh size (2 mm or less). This mesh opening size was criticized by fishermen in many villages. Another example comes from an owner-operator of a cast net boat. He told us "Not only the commercial fishery causes damage to the small-scale fishery but also small-scale fishermen sometimes leave their traps at fishing ground for a long time and, as a result of this, they occupy the waters for a long time".

(4) Effectiveness of law enforcement

The demarcated area under the project, came into force on 19 October 1999, and aims to prevent the operation of trawlers, push net boats, clam diggers, and night-time purse seiners in the project area. It is said that many trawlers and purse seiners come into the Bay from other districts or provinces after the closed season for the spawning of Indo-pacific mackerel is opened (15 February to 15 May). As the Bay

was substantially closed since 19 October 1999 due to the NE monsoon and this closed season, from the middle of May 2000, the project area will be subject to the first trial against the fishing fleet from the outside.

To prepare for this, the DOF will train volunteers in surveillance, arrange L/C "Khao Kuang" to be mobilized as a surveillance station in the waters where illegal fishing is most probable, and put another station on the island Koh Tha-lu for binocular surveillance. The radar with which L/C "Khao Kuang" is equipped has a range of 70 miles (maximum) and is capable of detecting surface objects down to a length of 13 m. In addition to these, marker buoys were recently deployed on the 3 km line from the main land shore.

Anchovy luring light cast nets are banned within 3 km from the mainland shore under the law that applies to the whole nation. This fishery was introduced in the project area by the eastern coast fishermen 6 years ago. Although the district fishery office has tried to prevent the illegal operation since the law came into force, fishing within 3 km by cast net boats from a few villages is presently still observed. In some villages like Ban Berd, anchovy luring light cast net boats have already been converted to other fishing methods. The officers told us that to be fair to all the illegal fishery cannot be left as it is.

2.3 Fishery administration

2.3.1 The aims and objectives of the project:⁵

The Coastal Small-scale Fisheries Development Project has been continuously implemented for several years throughout the country. This aims to assist the small-scale fishers to continue their fishing activities without disturbance from commercial fishing operations. It also aims to improve their fishing conditions by providing infrastructures, namely fishing piers, fishing gear storage and maintenance buildings, breakwaters, rain water tanks, boat pulling winches, revolving funding, promotion of aquaculture activities as well as artificial reef installation and the release of juveniles or fry into the fishing grounds. These will have the effect that the small-scale fishers' life is able to continue and will help to secure their fishing activities for the future. Since the name of project was changed to "Coastal Fishery Management Project (Fishing Rights)" and is conducted under the Thai Seas Rehabilitation Project and follows the concept of the coastal fishery management system in Japan by using fishing rights system. Bang Saphan and Bang Saphan Noi district are the first selected areas for the implementation of the Fishing Rights (Pilot) Project which aims to grant fishing rights to the fishermen in the project area.

Most of the fishermen in the 2 districts; Bang Saphan and Bang Saphan Noi have experienced serious trouble in maintaining their standards of living. Many commercial fishing boats including trawlers and purse seiners from other places have damaged the fishing grounds they use, catching juvenile fish and squid and destroying their fishing

⁵ "Project Documents: Coastal Fishery Management Project (Fishing Rights), Bang Saphan Bay – Bang Saphan and Bang Saphan Noi, Prachuap Khiri Khan", October 1999, DOF

gear. Trawlers are still coming to fish within the prohibited area; 3 km from shore. Fishing operations using less than 2.5 cm mesh size net with luring light; Anchovy cast net and purse seine also damage the juveniles of the marine resources in the area. These have led to the rapid decline of the fishery resources in Bang Saphan Bay and Bang Saphan Noi district. If this destructive gear continues to operate in the area, the marine fishery resources in this area will be totally destroyed.

There was an attempt to establish a fishing right system in Thailand in 1992 (2535) but the concept was not properly explained to the fishermen. Confusion arose on the meaning of "fishing right" in Thai language (the right to fish in front of a fisherman's house) obstructed the launch of the system. Fishermen understood that they could fish only in front of their house, it was impossible for them to follow this concept. The proposal was prepared but was never signed and implemented.

From 1995, the Upper Gulf Marine Fishery Development Center of the Department of Fisheries started to provide a budget and officers for the project area to collect baseline information on the fisheries and other related information. To carry out this project the Bang Saphan Noi District Fisheries Officer was appointed to be responsible for this project.

The information on this project has been explained step by step to the fishermen, the major encouragement is institution building; establishing fishers' groups and educating them on the project concept and the importance of fishery resources management. Initial activities of these groups are the management the revolving fund. DOF also supported the necessary scientific knowledge and budget for them to organize fishery development activities.

At the same time, the Marine Fishery Division of DOF, proposed this project to the Aquatic Resources Conservation and Regulation Committee (ARCRC) of the DOF. The result was, by constitutional and fishery law (at that time using the old constitution), this fishing right concept was against the law and could not be implemented. To revise the fishery law, and related regulations will take a long time. The suggestion of ARCRC, was that "the project can be started by banning some destructive types of fishing gear; trawlers, luring light purse seiners using less than 2.5 mesh size etc.. to operate in the demarcated area. But this action must be agreed by the fishermen in the project area.

On 19 October 1999, due to the fact that the Fishing Rights concept was against the constitution and fishery law, the declaration of the demarcated area in the project site was issued as a provincial ordinance; "Regulation of Fishing Gear that are Prohibited in some areas of Prachuap Khiri Khan Province" (see detail in page 21, 2.3.3 (1)).

2.3.2 The reasons for selecting Bang Saphan Bay as the project site⁶

(1) Bang Saphan Bay is an abundant resource area;

- 1) Bang Saphan Bay contains three Islands; Tha-lu, Sunk and Sing,
- 2) Behind the islands is a sea basin
- 3) Coral reefs are also near the islands

⁶ provided information by Mr. Sakul Supongpan; leader of rehabilitation of Thai Sea Project and Mr. Likit Boonsit; Fishing Rights project leader

- 4) There are five canals; Ao-yang, Bang Saphan Yai, Cha-muang, Bang Saphan Noi, Phang Dang, connecting with the sea. These factors make the area a nutrition source for a spawning base and juvenile habitat of marine resources.
 - 5) A rocky area along the coastline makes the sea abundant with the rock dwelling fish including grouper and snappers etc..
 - 6) This Bay is abundant in several types of sea shell; giant clam, pinna, sea clam, etc.. and pelagic fishes; Indo-pacific mackerel, Spanish mackerel, anchovy etc., also squid.
- (2) More than 80% of the fishermen in the area are small-scale and use artisanal fishing gear which is not harmful to the resources. These fishermen are facing two serious problems
- 1) Their fish gear such as bottom gill net, drift gill net, squid and fish trap are damaged by commercial trawlers, and purse seiners. These commercial boats mostly come from outside the area.
 - 2) Marine fishery resources have declined. As explained above, this area is an abundant resources area, Many commercial luring light purse seiners and trawlers (more than 100 boats) come from outside especially after the closed period of the Indo-pacific Mackerel spawning season (15 Feb.-15 May). These types of fishing gear, also the semi-scale of the anchovy luring light cast net used by the fishermen within the project area also cause damage to the juveniles of the economic fish and others important to the small fishes for bio-diversity. Most of the time these fishing gear break the law by operating within 3 km from shore and use less than 02 cm mesh size net. Due to the decline of the marine resources the fishermen in the project area have started to realize that their fishing operations are not make any profit for them (income cannot exceed the operational costs). They need to change their fishing gear and improve their fishing ground.
- (3) These fishermen understood the problems and try to solve them and also want to improve their fishing grounds. They also have a positive attitude toward the project and intend to involve themselves in the project activities. They understand and believe that this project will help to solve their fishery problems.
- (4) The Extension officer has been developing the attitude and understanding of the fishermen toward development projects for more than 16 years. Most of the fishermen are skillful at analyzing the problems and working in a group.
- (5) DOF cannot solve the conflict between the small-scale and commercial fishermen case by case. Further, due to the high operation cost and lack of manpower, law enforcement cannot be operated effectively throughout the area. DOF needs to start the new system, which is co-management by involving fishermen in the area in fishery resource management, which is composed of protecting and enhancing the fishery resources.
- (6) The Extension Officer (in this case the district fishery officer) sees the importance of understanding the concept of this fishing right project. Actually, in Thailand the district fishery officer is under provincial fishery officer. However, this project was initiated and implemented by the central office of the DOF. It will not be possible if the district fishery officer does not see the importance and work on it.

2.3.3 The regulations used in the project

(1) Project regulation "Regulation of Fishing Gear that are Prohibited in some areas (project area) of Prachuap Khiri Khan Province" This regulation has been in place since 19 October 1999

- 1) No types of trawler are allowed to operate in the area.
- 2) Push net fishing boats with engines are not allowed to operate in the area.
- 3) Clam draggers with engines are not allowed to operate in the area.
- 4) Purse seiners with engines are not allowed to operate in the area, except the daytime anchovy purse seines which are allowed to operate in the project area but outside 3 km from shore of the main land.

(2) Law of Coastal Fishing within 3 km from shore

- 1) No types or sizes of trawlers are allowed to operate within 3 km from shore.
- 2) Anchovy cast nets fishing with luring light are not allowed to operate within 3 km from shore.
- 3) Calm draggers with engines are not allowed to operate within 3 km from shore.
- 4) Push nets with engines are not allowed to operate within 3 km from shore.

(3) Law of Indo-pacific mackerel spawning season closed area.

The area covers from Ta Mong Lai Mountain in Prachuap Khiri Khan province to Don Sak, Surat Thani province and E100° 15' longitude. The close season starts from 15 February and continues to 15 May every year (90 days). The objectives of this law;

- 1) To protect the Indo-pacific mackerel spawners (first 45 days).
- 2) To protect the Indo-pacific mackerel fry (second 45 days).

This law was issued in 1984 and was used until the year 1999. The details of this law are as follow;

- 1) All types of trawler with engines are not allowed to operate in the area. **Exception;** beam trawlers and baby trawlers can operate at nighttime for the first forty-five days and may operate all day for the second forty-five day (the sizes of boats equipped with the baby trawl are around 14-22 meters).
- 2) No purse seines with purse lines are permitted to operate in the area.

After this law was issued, fishermen tried to adapt their fishing operations and use new technology to catch more fish. For example, fishermen adapted pair trawlers to be baby trawlers, there were no cast/lift nets using lights when the first law was issued but at this time there was a lot which were damaging the Indo-pacific mackerel fry, fishermen using surrounding gill nets that damaged the Indo-pacific mackerel fry. DOF decided to change some parts of the old law, which are as follows:

- 1) No types of trawler with engine are allowed to operate in the area. Except that single trawlers of not more than 16 meters OAL can operate only at night-time for the whole period (nighttime trawling operations are for catching shrimp).
- 2) Gill net boats with engines and using surrounding fishing methods to catch mackerel are not allowed to operate in the area.
- 3) All types of purse seine are not allowed to operate in the area.
- 4) Cast/ lift net with luring light for anchovy operation are not allowed to operate in the area (catching of squid is allowed but the mesh size is bigger).

- 5) Push net fishing boats with engine and a length of more than 14 meters are not permitted to operate in the area.

(4) Existing Anchovy fishery laws:

- 1) Purse seine of less than 2.5 cm mesh size are prohibited to fish at night time in the sea or bay in all coastal provinces (14 November 1991)
- 2) Nets or all types of fishing gear of less than 2.5 cm mesh size and equip with electric generators (luring light) are prohibited from fishing in the sea or bay in coastal provinces.
- 3) Anchovy cast nets with lure lights are not allowed to operate within three kilometers of shore.
- 4) Daytime purse seines cannot operate within 3 km. of the shoreline.

2.3.4 Scope and plan for implementing a Fishing Right System in Bang Saphan Bay
Detail of Present Activities and Future Plans under Fishing Rights Projects;

(1) Establishment of nine fisher's Groups

Nine fisher groups are established, spread through out the bay. Each group are located at each at one fishing village, only Ao Yang and Fai Tha groups have members from nearby villages. The initial objective of the fisher's groups is to manage the revolving fund of each village, which is provided by the DOF. Each group has a committee and members who are fishermen, members of fisher households or crews and middleman. Every member is able to borrow money for his or her fishery activities. Most of the groups are developed for not only borrowing but also saving money in order to increase the fund and to make sense of belonging to these fishermen groups.

Table 2.13 Revolving Fund of Fishier Groups in Project Area

No.	Name of Fisher Groups	Year of Establishment	No. of Members	Amount of Fund	Activities
1.	Ban Ao Yang	1992	120	400,000	Borrowing & Saving
2.	Ban Bang Berd	1992	78	400,000	Borrowing & Saving
3.	Ban Park Khlong Bang Saphan Noi	1994	33	200,000	Borrowing
4.	Ban Park Khlong Bang Saphan	1995	51	490,000	Borrowing & Saving
5.	Ban Phang Dang	1998	50	200,000	Borrowing & Saving
6.	Ban Kake	1998	33	200,000	Borrowing & Saving
7.	Ban Chai Tha Lay	1998	42	100,000	Borrowing & Saving
8.	Ban Nong Samed	1998	36	200,000	Borrowing & Saving
9.	Ban Park Pid (Fai-Tha)	1999	36	100,000	Borrowing & Saving

Capacity building passing through several kinds of training were organized for the leader and members these groups. Fishery Resources Management by fisher's communities is one of the main topics in the training.

As a future plan of the Fishing Rights Project, these groups will be joined into a cooperative and be granted the fishing right system from the government. The committee of each group will be selected as the representatives of a central or cooperative committee. (Activity No. 7 in fig. 2-1)

When the project advances into the next stage, it is planned to establish a fishery cooperative that comprises the present nine-fisher groups. Representatives of each group acting as a fishery cooperative committee. At that stage, role of the DOF will be to provide scientific knowledge for resource management, and act as the project consultant. The required research study in the project site will be undertaken by the Upper Gulf of Thailand Marine Fishery Development Center. Fisher groups or fishery cooperatives will be involved in the resource management. Necessary law enforcement will be executed jointly by the community and government sectors.

To strengthen the fisher groups, they need to acquire management skills and positive attitudes toward resource management. Fishers should understand the benefit of resource management in the long run. They should also understand the concept of "sustainable fishery development".

(2) Law Enforcement and Involvement of the Fishery Communities

In law enforcement activities in the project area, during August and September 1999, in the Bang Saphan Bay, five fishing boats were arrested for illegal fishing within 3 km from the shore. These were three trawlers from the Bay villages and two purse seiners from the outside. Among these five cases, the fishing gears of the fishing boats were confiscated. Since October 1999 when the demarcated waters became effective under the project, there have been no arrests so far possibly because of the monsoon and the closed season for Indo-pacific mackerel.

The Juridical process after arrest for illegal fishing is as follows;

- 1) The DOF patrol office is in charge of arresting suspected persons and recording the facts that constitute a crime.
- 2) The police are in charge of the criminal investigation and prosecution.
- 3) Criminal courts gives judgement.

If an arrested boat is found guilty, the accused owner is fined Bt.5,000 to 10,000 per crew or is sentenced to one year in prison at a maximum. The fishing boat can be confiscated only when the owner is onboard, except in the case of fishing by means of poison, explosive or electric shock. Informants reporting the case are rewarded. Comment of the fishery officer "the restriction of jail are too lenient, as a convict may go out if accompanied by an officer. The jail restriction should be more punitive, the fine is too low also, but it is believed a prison sentence is the most effective punishment."

There is an example explaining why they think the fine is too low. One day their patrol officers found an illegal purse seiner and steered their patrol boat towards the suspected fishing boat for investigation. On the way, they could hear, through the radiotelephone, communication between the fishing boat and its land station. The captain of the fishing boat asked the owner, the captain's father, whether he should give up the catch to avoid to be arrested. The owner asked his son the estimated amount of the catch, and after getting the answer, the owner instructed his son to continue illegal fishing. The catch amount was around Bt.300,000 and the fine was Bt.100,000. So there was no reason for the owner to give up the catch.

Operation of the patrol boat: the patrol boat consumes 120 liters of fuel per hour. The price of fuel is Bt.15/ltr., thus it requires Bt.2,000 for one hour's operation,

including lubricating oil and other supplies. Under the current operational budget, the boat may be used only 4 hours/month.

Walkie-talkies: for the surveillance of illegal fishing boats, a walkie-talkie is delivered to each of the volunteers of the nine fisher groups to contact the project office when illegal fishing activities are detected in the project area. Frequencies used with the walkie-talkies are VHF and can be easily monitored using other VHF radio receivers.

(3) Enhancing Fishery Resources

1) Artificial reefs Installation:

In total, 3,802 cubic concrete artificial reef structures were installed in the project area from Khao Mae Ramphung down to the east of Tha-lu Island between 1990 to 1996. These were placed in positions at the four corners or center of 500m x 500m squares that are situated along a line connecting the above two points; that is, for each square, 40 artificial reef units were installed in corner positions and 150 units at the center position respectively. At all of these positions of the corner or center, artificial reefs were dropped in a way to make a further smaller square. Thus, a large square has five small squares, among which one is at the center and the other 4 are at the corners. Two of small squares at the corners are shared with the next large square.

In the year 2000, DOF plans to install artificial reef at the south of the project site; from the east of Tha-lu Island down to the end of the project boundary. For this installation, L/C "Khao Kuang" will be used. The vessel is presently engaged in surveillance of illegal fishing in the project area.

2) Giant Clam Marine Park at Tha-lu, Sing and Sung Islands:

According to the Thai act of legislation on the Protection and Conservation of Wild Animals, and the Convention on International Trade in Endangered Species of Wild Fauna and Flora, The Giant Clam is considered as an endangered species which should be conserved and enhanced. The objectives of this project are;

- a) The rehabilitation of the Giant Clam,
- b) The conservation of the Giant Clam,
- c) The enhancement of the Giant Clam in Thai waters,
- d) To be a study center of Giant Clam and marine ecology,
- e) To create awareness of people on aquatic animal conservation, and
- f) As a tourist area.

The planed activities of this project are;

- a) A demarcated area for a marine park: 0.5 mile around Tha-lu, Sing and Sung Islands,
- b) The announcement of prohibited fishing gear within the marine park,
- c) The construction of an office and residence for the patrol officer on the island,
- d) The release of 20,000 tagged Giant Clams
- e) Setting up a guard system by the sub-district administrative committee, Prachuap Khiri Khan Coastal Aquaculture Development Center, Upper Gulf of Thailand Fishery Conservation Unit, Fishery Conservation

Volunteers, and Fishers' Groups of Moo 3, 4 and 5, Sai Thong sub-district.

f) Public relations on the marine park project.

(4) Preparation of the Demarcated area

To demarcate the area was one of the difficult and important activities in this project. Project officers had to inform and educate on the project concept and future beneficiaries not only to the fishermen but also to the related officers at the same and higher levels. This is because to demarcate the project area and not to allow some types of destructive fishing gear to be operated in the area this must be controlled by a law and the law needs to be issued. To prevent conflict within the project site the law must be based upon a majority agreement of the fishermen in the project area. At present there is no fishery law on Fishing Rights. It is still in the process persuading the fishery policy makers to issue new fishery laws that are conducive to Fishing Rights implementation.

Demarcated area regulation (see regulation page 21) became effective on 19 October 1999. Most of the fishermen in the project area agreed upon this regulation, except for some fishermen who are operating anchovy luring cast net and anchovy luring purse seine. This was because the regulation does not allow operating anchovy luring purse seines at the project site. For the anchovy cast net fishermen the regulation does not actually effect them but the surveillance will be stricter, not to allow them to operate "sai-mai" fishing within 3 km from shore. There will be more conflict from outsider fishermen, who have previously fished in the project area. Since October 19 until now the conflict has not yet started because October-January is the NE Monsoon season, and from 15 Feb.- 15 May is the close area for the Indo-Pacific Mackerel spawning season. It was not the season for outsiders to fish in the project area. After 15 May the Project officers foresee that some conflict with the outsider fishermen will occur.

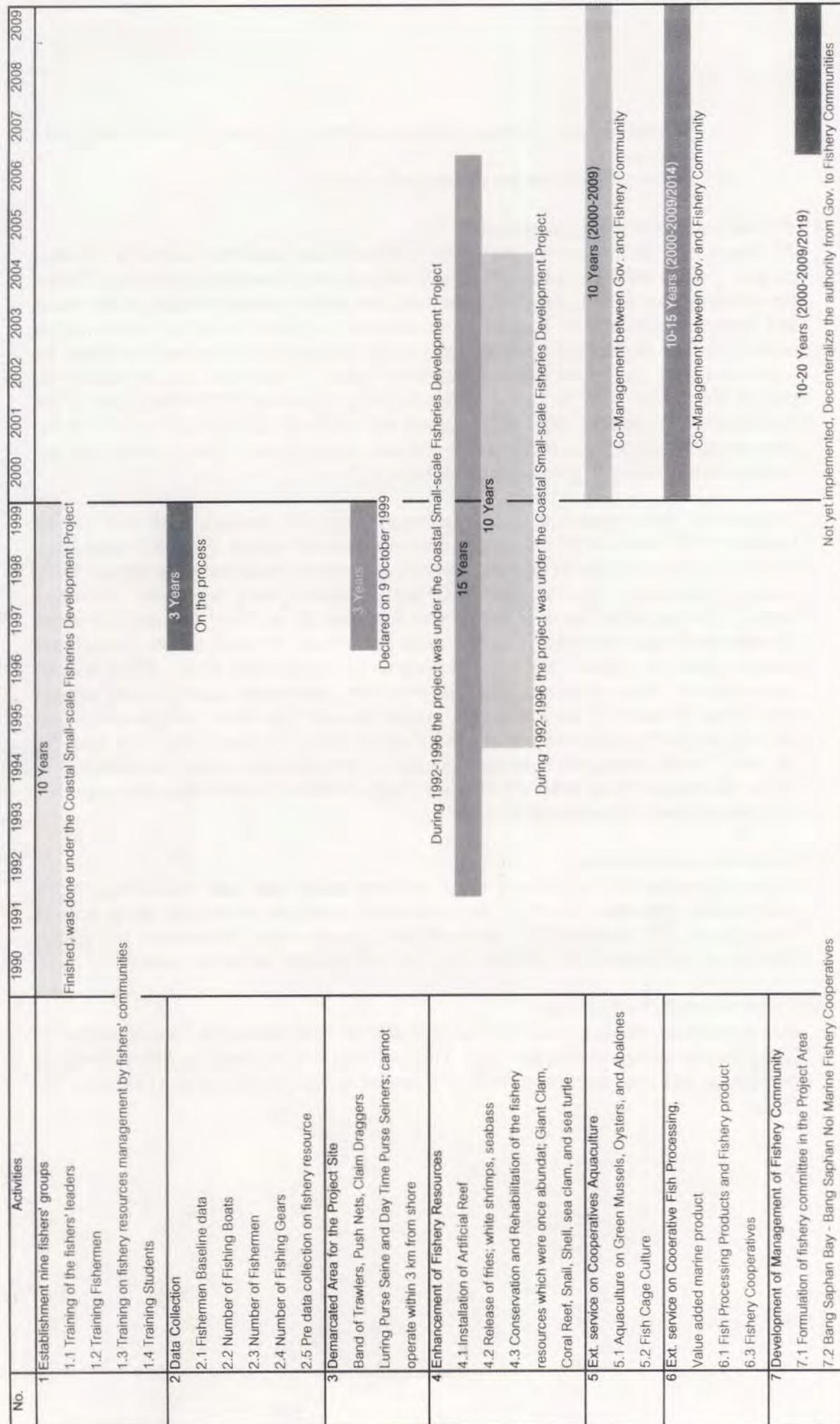
(5) Cooperatives Aquaculture

Some fishermen who are fishing using anchovy luring cast nets intend to give up their fishing operation. The DOF supports these fishermen to culture green mussel in the group. For the year 2000 there will be 2 groups with 20 members per group. Each group will receive Bt.400,000 from the DOF budget as the investment.

(6) Cooperatives fish processing

Fish processing buildings and cool storage will be built behind the project office in Nong Samed village during this year. This building will be used for fishery product processing and cool storage as well as a central market for the nine villages in the future.

Fig. 2-1 Scope and Plan for Implementing Fishing Right System in Bang Saphan Bay



source: "Project Documents: Coastal Fishery Management Project (Fishing Rights), Bang Saphan Bay - Bang Saphan and Bang Saphan Noi, Prachuap Khiri Khan", October 1999, DOF

CHAPTER 3 THE PROPOSED FISHING RIGHT SYSTEM IN BANG SAPHAN BAY

3.1 Basic conditions to start the system

3.1.1 Our original questions

To attain one of the study objectives, we have tried to generalize methods and the results of our study on the fishing right so that these can offer referable hints or points of view to other similar studies in Thailand or in other regional countries. As one of the trials, we started our study by selecting an approach. Before considering it, we needed to discuss precedent cases of fishing right. It can be said that the fishing right system, if we limit it within a modern juridical structure, was initiated in Japan. Because of its history and the extent of scale, experiences in the Japanese fishing right system gave valuable information to us. We do not think however, that the system can provide us with an easily applicable prototype, because of the difference of social and historical backgrounds, and probably different fishery resource conditions. If we do not have a model on which we can base our work, we have to develop concepts of the fishing right, or at least adjust the concepts already developed, so that it can reflect these background conditions.

The fishing right system is apparently not a task that can be implemented easily. It may require some social, institutional, juridical and other conditions to start with, in addition to the available fishery resources. If the system needs such conditions, before considering the system itself, we need to know what kind of conditions we should study, and how these are actually presented in the current project site. In our study, this approach has been expressed in form of questions.

Our original question was “what conditions does this fishing right system require so that it will work as expected?” This question is followed by several sub-divided questions, and prior to the field study, we assumed four issues for the basic conditions to start the fishing right system; that is, fishery resources, possible conflicts, management ability, and administration initiative, as listed hereunder. If the fishery resources have not, for some reason, historically been used at all in some places, the system will not be needed at that place. If conflicts among fishermen are not tolerable, or even without conflicts, if fishers cannot manage well, the system will not work for long. Further, if the administration does not take the initiative, the system can not pass the necessary juridical process or law enforcement does not effectively work.

- (1) Utilization of resources: Which fishery resources should the fishing right cover? Who in the project site depends on the resources? In which way and how much is the resource presently utilized?
- (2) Possible conflicts: Can the system cause any conflict among resident fishers and with non-resident fishers? If conflict is unavoidable, how it can be offset by the administration and fishers themselves?
- (3) Managing ability of fisher organization: How can the fisher groups or organizations manage the system? What kind of ‘authorization’ and ‘ability’ must a fisher organization have to manage it?

- (4) Administration initiative: Can the administration take the initiative? Should consensus to grant the exclusive right to fishers be generated among the policy makers and administrators concerned? What administrative measures have been or will be taken to shape the system?

Now in this chapter, we look at how these conditions are presented in real life in Bang Saphan Bay.

3.1.2 The utilization of the resources and its beneficiaries

Due to the abundance of fishery resources in the Bang Saphan Bay, these have been utilized not only by local fishermen but also by purse seiners and trawlers that come from the other districts or provinces. These larger visitors have come to the Bay every year, especially immediately after the end of the closed season for Indo-pacific mackerel on 15 May. Since 19 October 1999, under the provincial ordinance, trawlers, push net boats, clam draggers and nighttime purse seiners have, if these are equipped with engines, been banned to operate in the project area throughout year. However, daytime purse seiners, despite boat size, are still allowed to operate in the project area, excluding the waters within 3 km from the mainland shore, during the term other than the closed season for Indo-pacific mackerel.

The following table gives fishing methods that are allowed to operate in the project area since 19 October 1999. This shows the possible maximum scope of fisheries in the Bay for which the fishing right can be applied affirmatively or negatively. In the small-scale fishery, non-mobilized bottom and surface gillnets, fish and squid traps, hook and line are included, and that are presently used in this sector in the Bay.

Table 3-1. Fisheries Allowed in the Project Area after 19 October 1999

Districts	Fishing methods	Operation conditions	
		Duration	Area
Bang Saphan & Bang Saphan Noi	Small-scale fishery	No limit	No limit
	Squid-cast net*	No limit	Excluding 3 km range
	Anchovy cast net *	No limit	Excluding 3 km range
	Daytime purse seine	15 May to 14 Feb	Excluding 3 km range
Other than above two	Small-scale fishery	Although having same conditions as above under the laws, their operation in the Bay is not probable or negligible due to boat endurance.	
	Squid-cast net*		
	Anchovy cast net*		
	Daytime purse seine	15 May to 14 Feb	Excluding 3 km range
	Indo-pacific mackerel gill net	15 May to 14 Feb.	No limit

*Remark: * Government prohibited fishing nets or every kind of fishing gears with less than 2.5 cm mesh size and equipped with electricity generator (luring light) to fish in the sea or bay in coastal provinces.*

3.1.3 Possible conflicts

When the fishing right system becomes fully activated, the ones that conflict are anticipated to be against the small-scale fishery are anchovy luring light cast net and daytime purse seine as shown in table 3-1. In addition to these, it is needed to discuss fishery that is not allowed, or legally prohibited but substantially allowed, partly or wholly in the Bay at present, as it may still cause conflict with the small-scale fishery if the necessary law enforcement does not work well. Conflict with illegal fishery are the type of problem that should be handled by law enforcement and not by the fishing right system, at least directly, which means we do not need to incorporate measures against illegal fishing in the concepts of the fishing right.

However, in addition to legalities, we have listed possible conflicts caused by illegal fishing as shown in table 3-2, because it may badly affect the implementation of the system and hence it is expected that, against ones listed here, the administration should take necessary measures for stricter law enforcement before starting the system.

Table 3-2 Possible Conflicts against Legal and Illegal Fishery

Type of fishery	Fishing methods	Claimed damage on small-scale fishery
Legal fishery	Anchovy cast net (3km<)*)	Catch of <i>sai-mai</i> and other juveniles may cause resources decline.
	Daytime purse seine	May cause damage to fishing gear
	Indo-pacific mackerel	May cause damage to fishing gear
Illegal fishery	Anchovy luring cast net (3km>)	Catch of <i>sai-mai</i> and other juveniles may cause resources decline.
	Nighttime purse seine (including Chinese purse seine)	May cause damage to fishing gear and resource decline due to luring lights
	Trawl	Causes damage to fishing gear and resource decline
	Cyanide fishing	Causes contamination and resource decline

Remark: * Anchovy luring cast net using mesh size not more than 2.5 cm is illegal, even operated farther than 3 km from the shore, as described in the previous chapter.

It appeared to us, when we interviewed an owner of an anchovy luring light cast net boat, that he knows very well of the criticism directed to their *sai-mai* fishing and what problems they may give to fishery resources in the Bay. He told us however, that he does not want to stop it in order to sustain his family livelihood. One fisherman in the small-scale fishery sector told us that some of the anchovy cast net fishermen could not stop their *sai-mai* fishing because of their debts. Discussion or opinion exchange on the *sai-mai* fishing among fishermen seems to be already substantially started in the Bay.

It is foreseeable that, so far as the present mesh opening size (2 mm or less) is continued in use, it will be difficult for small-scale fishermen to share fishing grounds with *sai-mai* fishing, because any measures to conserve fish species under the fishing right system may become useless when their juveniles are caught without restriction. Under

this situation, the DOF intends to take measures to stop anchovy luring light cast nets in the Bay as an illegal status and to convert these to other types of fishing.

3.1.4 Management capability of fisher organization

Our interview was made mainly with core members (leaders or accountants) of the groups. Their sense to locate problems in the fishery resources was sharp, and their attitude to look for ways of fishing management was keen. They strongly feel that the resources in the Bay have received higher fishing pressure for many years and the decline cannot be stopped without some effective measures. Fishermen of the small-scale fishery hope that the pilot project can succeed and continue to the further steps.

They believe they can handle the resources management with appropriate assistance by the government, one fisherman said, that, includes the necessary budget, infrastructures and scientific knowledge. One of them told us they can do it because they are familiar with community collaborative work. Another said that, though fishermen always seek profit, they will respect the rule, as the rule may produce better profit.

Considering the fishermen's attitude observed as the above, we consider that fishermen in the project site, at least the ones in the small-scale fishery sector, can build up the necessary expertise among themselves to manage the fishery resources.

In the DOF plan, the fishing right in the current project site is planned to start after a fishery cooperative is organized based on the current nine fisher's groups. As mentioned above, it can be concluded that the fishermen in the Bay are able to operate a fishing right management body. For a fishery cooperative, however, we need to look at their management ability from an additional viewpoint, since a cooperative operates various businesses. As shown in the existing fishery cooperatives in Thailand, generally their business includes fish marketing, bulk purchase of fishing and living necessities, credit services, cold storage and ice plant operation and others. Among these businesses, we believe that especially fish marketing requires management skills of a higher level due to fact of competitive markets. Presently there is no case that fishermen operate self or joint marketing in the project site.

3.1.5 Administration initiative

For the current pilot project, the DOF has undertaken and completed various actions so far under the Thai Sea Rehabilitation Project as outlined in Chapter 2, para. 2.3. Several future plans for the next 10 to 20 years have also been formulated, these include organizing a fishery cooperative and the decentralization of fishery management from the government to the fishery communities. For more than 10 years, extension services have been conducted in Bang Saphan and Bang Saphan Noi to raise the fishermen's awareness on resource conservation and other matters. As one major point of progress, the demarcated area was introduced to the project site in October 1999 under the provincial ordinance through the initiative of the project officers under the Thai Sea Rehabilitation Project.

From these events, we note that this pilot project has been developed mainly by the efforts of a working team of the government officers, and hence it can be expected that further initiatives by the administration will be continued by the project officers under the Thai Sea Rehabilitation Project.

For the implementation of future plans, administrative decision making of a broader scope and at a higher level, as well as the enactment of relevant laws that cover fishing rights and fishery cooperatives, will be required. This may transfer the pilot project to a different sphere where political mechanisms work, while a working team from the DOF under the Thai Sea Rehabilitation Project is to be kept or reinforced to supervise further implementation of the current project in Bang Saphan Bay. Under this situation, organized support for the working team by higher DOF officers will be required, especially for generating a national policy relative to fishing right. We also envisage that more institutional support or human resources will be needed, especially in the scientific areas to supply necessary advice and information to help the working team to proceed with the project.

3.2 Proposal of a Fishing Right System in Bang Saphan Bay Project

3.2.1 Beneficiaries of the Fishing Rights Project in Bang Saphan Bay

Implementation of a Fishing Rights system should benefit the fishermen in the project area in the long-term. The objective or intention is to enhance the fishery resources in the project area, which will benefit to the fishermen to improve their fishing production and income as well as their living standards. The system/activities, which will be harmful to the fishery resources and decrease the income of the fishermen in the long-run, should not be organized.

80% of the fishermen in the project are small-scale. The poverty issues are in these villages. The project should not aim only to manage coastal fishery resources, but should also reduce poverty by reducing operation costs by the decrease of fishing gear damage and of mileage to and from the fishing grounds. This will be realized by increasing fishing production through the recovery of resources.

3.2.2 What kind of rights should be granted to fishers' communities?

(1) Fishing Right:

We have listened to opinions that say that the fishing right can be deemed as, or is equivalent to, property rights. The following definition is given to the fishing right by Fishery Department of Thailand

"The Fishing Right System acts as a kind of property right, by which fishermen will have exclusive rights to use the sea areas and resources that are specified in each fishing right. In this system, a Territorial Use Right in Fishery may be granted to fishermen's groups based upon a legal framework (law) established by the government. With the Fishing Right System, fishermen themselves, may create their own fisheries management systems, which should result in the conservation of fishery resources as well as an improvement to their income and living."

According to the DOF definition, the words "property right" may cause confusion to many people. A property right implies not only the right to use as mentioned in the second sentence of the DOF definition, but also means the right to own that property.

It can also be understood that, to let fishermen have the exclusive right, the system needs to wear the clothes of property rights. The exclusive right does not mean to own the waters as one's property. In the Fishery Law of Japan, the fishing right is deemed as a "real right" under the Civil Law so that (roughly summarized), when fishing is, or is going to be, obstructed, fishermen can have right to have such obstruction eliminated or prevented. We understand that a real right is assumed mainly to secure these claim rights of fishermen. It is clearly mentioned (Hirabayashi, et al. 1980) that, fishing rights in Japan is not a right to occupy the waters or to exclusively use the whole fishing ground.

However, accompanied by the development of the national economy, unexpected situations have become apparent over time. For example, in Japan, in urban or some rural areas, when a fishery cooperative agreed with a commercial company such as an electric power company to let them construct some facilities near the shore area, compensation from the company went to that fishery cooperative, but not to other people who should have the right of access to the shore. In this story, the fishing right seems to have been treated as a property right. This kind of event would oppose the national constitution in Thailand (the sea belongs to the state and everyone has access to it).

Furthermore, "Property Rights" should not mean to own any marine fishery resources. The marine fishery resources do not belong to anybody until it is harvested. If the any fishery cooperative or community owns marine fishery resources in any area, they may not conduct any fishing activities by themselves but they may sell or allow other people or organization to conduct fishing operations. Under such circumstances, the fishing right would lose its meaning.

The Rights, which will be granted in Bang Saphan Bay project, should be considered as a **Right to Fish not the Right to own the sea area or any marine fishery resources**. This Right should enable a fishery community to exclusively fish or access the fishery resources in the project area. Apart from fishing activities, others may also use the sea in the project area for other purpose, e.g. scientific study, tourist business, recreation etc., as long as these do not unreasonably obstruct the fishing activities under the fishing right.

(2) Closed access:

We learned from our interview that to a implement fishing right system in Bang Saphan bay the DOF has the idea to close the project area against any kind of fishing boats from other districts and provinces. Additionally to the present banned fishery that became effective since October 1999 and that such an idea has been explained to the fishermen. We understand that the closing of the waters means that, under the fishing right, the fishery cooperative will have the exclusive fishing right to utilize the whole of the resources existing in the demarcated area, subject to full utilization of these by the member fishermen⁷. We have to note that, using this

⁷ In comparison with the above, there is another kind of fishing right system where a fishery cooperative is granted the fishing right only for a set of specific fishing methods. The cooperative can have its exclusive fishing right only for specific gears against other fishermen or citizens, that is to say, the others can not use these gears in a certain area, while other (not specified) fishing methods are opened to licensed or free fishery. This type of the system intends to enable higher utilization of the resources. In our understanding, this type also needs some additional measures to

system the law enforcement to the outsider fishermen must be strict. Anyhow the concept behind the closed access is to create a sense of belonging of resources to local fishermen so that the fishermen are willing to take care of their resources. Partnership mechanisms in law enforcement between government and fishermen should be established.

In the case of the current pilot project, the closed system will be appropriate by reason that an empowered coordination authority (Refer to the foot note) cannot be expected to be established in the near future. The closed system has been started partly under the provincial ordinance. However, it will be rather difficult to conclude that the closed access is adequate when formulating the system that is applicable nationwide, until enough information on the actual fishing activities, especially on their fishing grounds, by small-scale and commercial fishery can be obtained.

(3) Fishing Gear Based:

According to the fishing ground conditions and the nature of the fishing operation of each fishermen in Bang Saphan Bay, The **Fishing right should be based upon fishing method or gear used (Gear based⁸)**. Each fisherman in the project area should be allowed to select fishing gear or fishing methods that will suite them best. One fisherman may operate 3-4 types of fishing gear or methods throughout the year. Whatever they get can be sold to the market. **Resources based⁹** will not be suitable to this project, It is because each of the fishermen fish throughout the year and take any kind of fish that gives a good price at the time.

(4) What fishing gears/methods should the fishing right cover?

In term fishing ground management, the number of each fishing gear or method in the project site should be controlled. It should be balanced to the reproduction capacity of the sea.

From the study, according to the available resources, the types of fishing gear that should be allowed in the project area are;

- 1) Gill Nets, namely Swimming Crab gill net, Indo-Pacific Mackerel gill net, shrimp gill net, Sillaco gill net and other kind of fish gill net
- 2) Traps, namely Squid trap, rock fish trap, and fry fish trap
- 3) Cast Nets, namely Squid cast net and anchovy cast net (2.5 cm mesh size)
- 4) Daytime Purse Seines, namely anchovy purse seine, Indo-pacific Mackerel purse seine.

In case of the anchovy luring light cast net, at present these are violating the fishery regulations for anchovy fishing by using a very small mesh size net (less than 0.2 cm) this damages the juveniles of other aquatic resources. The types that should be allowed must follow the existing law by using a 2.5cm mesh size and must be operated outside 3 km from the shore.

secure the fishing right by strict coordination by an empowered authority and by making the fishing right be accompanied with another right, such as a real right, as in case of Japan.

⁸ Gear based; fishermen are allowed to fish according to fishing gear/methods used.

⁹ Resource based; fishermen are allowed to fish according to the species of aquatic resources.

Because of less dependency on the resources under the fishing right, resident daytime purse seine fishery may be allowed to continue in the project area for better utilization of the resources. However, it should not cause any problems to fishery resources and other fishermen's fishing operation or gear. If it causes any damage in the future, its operation in the area will be limited or banned by under the cooperative rules.

From the above consideration, in the case of the current project, if the closed system is applied for the demarcated area, one fishing right covering gill net, trap, cast net, and daytime purse seine is suggested. Although considerable numbers of cast net boats and purse seiners among those in the project site have a size of commercial scale, we observe most of them depend on the resources in the area and its vicinity. It is not easy for them to move to somewhere the outside to seek more profit. Rights should be given with responsibilities.

(5) Right should be given with responsibilities:

Fishing rights should be accompanied by management responsibilities. Fishermen should not have only the right to fish but should have an obligation to take care of the fishery resources. The associated regulations or projects plan should have the concept of adequate utilization and rehabilitation of fishery resources for the benefit of the fishermen in the long-term. As an example given by a fisherman in Chai Tha lay village, during the peak time of the swimming crab spawning period the bottom gill net should be prohibited. There should be some regulation to protect spawners of some species including Indo-pacific mackerel, swimming crab, squid and others.

To ensure resource management under the fisher's responsibility, it is suggested to oblige the fishery cooperatives to plan and submit the "rules to exercise the fishing right", details of which are shown in Chapter 4, para 3.4.1 (1).

Another related activity, which DOF has tried to organize, is fishery volunteers to closely watch for illegal fishing in the project area. These volunteers can inform fishery officers to arrest or to do something following administrative procedures. This activity is an important initiative in the fishing right system. Due to the insufficient number of patrol officers and amount of budget, it is impossible for the DOF to mobilize surveillance frequently enough and direct the necessary investigation for illegal operations.

(6) The whole demarcated area as one fishing ground:

Fishing grounds in the project area should not be divided. As shown in results of our study (Annex 5), we found that in the south of the project area the fishery resources are much more abundant, especially around Tha-lu, and the Sing and Sung Islands. Most of the fishermen in the nine villages are sharing these resources among themselves. It may not be fair and may cause some serious conflict if the fishing ground will be divided for any reasons like the location of the fishing village or a plentiful area of one or other species.

3.2.3 To whom the Right should be granted?

(1) Not to individuals but to fishers' organization

To manage coastal fishery resources with the participation of the local fishermen, it

is necessary to encourage the local fishermen to build their own organization to play roles in organizing the management activities. To coordinate with the government and other institutions, and sharing the resources among themselves. Fishing Right should be granted to this organization and the government can delegate their authority to it to manage the marine resources. This local organization should belong to the fishermen by regulation and practice. They should have control over it in term of management and the sharing of benefit.

In Bang Saphan Bay, the Right should be granted to the fisher's organization not to individual fisherman. DOF plan to join nine groups in the project area into a fishery cooperative. This fishery cooperative will represent all the fishermen in the project area. The nine fishers' groups in Bang Saphan Bay are experienced in revolving fund management. Also in other fishery activities extension officers have been worked with them for more than 16 years, to educate them to develop a positive attitude toward sustainable fishery development and fishery conservation. The steps of preparing the fishermen to be able to run a Fishing Right System is very important. One or two years will not be enough.

To fulfill these functions fishery cooperatives can be a suitable way to run a Fishing Right system.

(2) Advantages of Using Fishery cooperatives to manage coastal fishery resources

- 1) The members of a cooperative are real members by law and practice. The members have the right to involve in the cooperative's activities and to monitor and select their own leaders. This can guarantee that the benefit of the cooperatives will be shared equally among the members.
- 2) According to the principle of cooperatives, members will be encouraged to participate and be responsible for the cooperative's activities.
- 3) If management of the coastal fishery resources is successful, the production of the fishermen will increase. Marketing and processing of the products will be issues that the fisher organization must deal with in the near future. A Fishery cooperative is a legal organization, which has the authority to run the business concerned with fishery production and marketing. Mostly the activities of the cooperatives are marketing and processing of fish and fishery products, providing their members with fishing equipment and other necessities at cheaper prices compared with the market, and to provide loans at low interest rates for their members.
- 4) It makes full use of the indigenous knowledge and experience of local fishers in formulating management regulations that fit local conditions. Rules and regulations are agreed upon by fishermen in advance, and thus do not need to be enforced by an outside agent.
- 5) The results of the Regional workshop on Coastal Fisheries Management based on Southeast Asian Experiences which was organized by SEAFDEC in 1996; it was concluded that the establishment of fishers' organizations or fishery cooperatives could lead to the success of CFBM and fishery cooperatives can work if they are allowed to work.

(3) Factors to be considered in establishing and organizing cooperatives

- 1) Cooperatives should have clear benefits for the fishermen. Its activities should concern more with fishery management and the implementation of the fishing right system. Providing fishing right to the members will encourage the fishermen to become the members of the cooperative.
- 2) The direction of cooperatives should be changed to respond to the immediate problems or needs of the fishermen. It should concern itself with both economic and fishery management issues. Supporting only inputs for fishing operation may lead to the fishermen to become more indebted if the problem of fishery resources decline is not yet solved.
- 3) The fishery cooperative laws should be enacted to facilitate the new directions and roles of fishery cooperatives in fishery management. At present most cooperatives are concerned with economic activities to improve the living standards of the members.
- 4) The objectives of fishery cooperatives should be capable of achievement in both the short and long-term. The short-term objectives should be the immediate problems of fishermen namely development of fishing grounds and in the long-term should focus upon the improvement of living conditions of fishermen and sustainable development of fishery resources.
- 5) The current problems and constraints in the operation of fishery cooperatives, namely, the lack of understanding by the members of the cooperative's principles, lack of the managerial skills of the committee members and cooperative workers or low salaries for the cooperative workers should be minimized to ensure success.

(4) The roles of fishery cooperatives in coastal fishery management

In order to represent the local fishermen in the management of the coastal fishery resources, the cooperatives should play an extra role beyond the normal activities which many cooperatives usually organize for their members, namely marketing and processing fish and fishery products, providing fishing equipment and other necessities at cheaper prices and to provide loans at low interest rates. These extra roles can be defined as follow;

- 1) To be authorized and responsible for management of the granted fishing rights from the government.
- 2) To delegate the fishing right to the members of the cooperative.
- 3) To utilize and manage the coastal fishery resources in fishing for the benefit of the members in the long-term.
- 4) To set up coastal fishery management regulations of the fishing area with the involvement of the members.
- 5) To plan coastal fishery development and management programs.
- 6) To create awareness in the members of sustainable fishery development.
- 7) To coordinate between the government and the local fishermen.

3.2.4 How the right should be granted and exercised?

(1) Granting of fishing right and measures to control fishing pressures

As mentioned above, in the case of the current project, the whole project area will be demarcated as a single fishing ground, and for capture fishery, a fishing right covering gillnet, trap, squid luring cast net and daytime purse seine (in case of the purse seine, accompanied with some conditions) will be delegated to a fishery cooperative. Under this fishing right, the fishery cooperative will allow members to enjoy exclusive right in accordance with their rules. The rules and regulations, for each of the fishing methods, the necessary and appropriate measures to utilize the resource and obtain effective approval of the administration at provincial or national levels.

In its rules exercising the fishing right, a fishery cooperative can and must regulate their fishing activities within a consensus of the member fishermen. The administration will not need to control fishing pressures by means of fishing gear registration anymore, but will be able to do it when reviewing the cooperative rules to exercise the fishing rights.

Fishermen from outside, non-member fishermen, will be or will not be allowed to operate their fishing in the demarcated area in accordance with the cooperative rules, if the rule makes provision in the piscary system. The piscary system can be regulated in the fishing right relevant law, and in this case, the cooperative rule will give the details.

(2) Qualification of members

Qualification of members is to be provided for in the fishery cooperative laws. Some detailed qualification conditions can be incorporated in the articles of association of the cooperative to reflect the local fishery structures. Every qualified fisher should be able to be members and thus exercise the fishing right so as to sustain his or her family.

(3) Trade of the fishing right

The fishing right should not be sold or transferred to other organization or individual.

(4) Validity of the fishing right

There is no clear base to discuss the validity of the fishing right. The fishing right should however be able to be exercised by fishers for a reasonably long time period without interruption. In the case of the fishing right system in Japan, a validity of 5 to 10 years is stipulated in the laws, generally followed by renewal.

3.2.5 How to solve the conflicts caused by the implementation of fishing right system?

(1) Conflict within the project area

According to the sensitivity of any conflict between local fishermen in the project area, mentioned in Chapter 3. para 3.1.3,. If the benefit of the resources cannot be share fairly, it will cause difficulty for the DOF to delegate authority for managing the resources to these fishermen. Under the community-based fishery management (CBFM) concept, fishermen in the project area should be unified to run the fishing right system. The benefit should be considered not for the short term to a particular group of fishermen but should be considered as a long-term benefit to all in the

project area. For example, even though *sai-mai* fishing is an illegal fishing operation when looking at the fishing gear to be used (mesh size less than 2.5 cm.), in the real situation many fishermen in the project site are still catching *sai-mai* fish. It is necessary to prove the case, based upon scientific knowledge, and to educate these fishermen to understand how *sai-mai* fishing operation is damaging the small targeted fish of other fishermen. By understanding the fact, *sai-mai* fishermen will accept and follow the regulation. DOF should have a plan to assist them by providing a special loan or information for alternative fishery activities.

There is a need to conduct a research study on *sai-mai* and anchovy. The biology of these two fishes have to be clearly explained, what type of fishing gear is appropriate for catching, which is not harmful to other resources. In terms of catching *sai-mai* if the benefit is not long-term, it should be banned. The result of this study has to be clearly explained to fishermen. If there is any doubt on this matter, it will have a fatal effect on the fishing right system in the future.

(2) Conflict with fishermen from outside project area

Refer to the table 3-1 and 3-2 in Chapter 3, The fishing ground of the project site has been utilized not only by the inside fishermen. There were many fishing boats from different districts and provinces catching fish in Bang Saphan Bay. Since the provincial ordinance issue in 19 October, 1999. Some of legal fishing gear became illegal for operation in the demarcated area; inside 3 km from the shore, namely trawlers, push netting, clam draggers and nighttime purse seine. It means that they lose some of their fishing grounds within the demarcated area.

It may be difficult for outside fishermen to accept this regulation. But the important point is to start implementing the new system as a fishing right will not be easy for the government to make everyone satisfied. The premise of fishing rights is an approach to fishery management for sustaining the utilization of coastal fishery resources in the long-term. The government must to look beyond the existing problems of the conflict between inside and outside fishermen. This pressure of conflict will decline if an expansion of fishing right system is going to the areas nearby and will make people understand that as the fishery resources of the coastal area become abundance this will have effect in the vicinity. In line with educating fishermen to understand the importance of fishery management the law enforcement must also be conducted very strictly.

3.3 Policy and the necessary laws and regulations to set up the system

In addition, implementation of fishing rights in Thailand is currently being implemented as a pilot project. It is in the process of a feasibility study; studying the fishermen's attitude toward the fishing right system, to study the necessary laws and regulations and implementing a pilot project in Bang Saphan district, Prachuap Khiri khan province. Open access to the sea has been used for a long time. Fishermen are used to this system and afraid to use a new system. It takes time to educate fishermen to understand and accept this new system.

According to the project in Bang Saphan Bay, It has passed the initial step; educating fishermen on the overall view of the fishing right project, demarcation and the

enactment of the law to the project area has been carried out. However there are many steps that must be followed.

3.3.1 National policy to support the system

At present sustainable management of coastal marine resources should be the most important issue in fishery development policy and should take precedence over the need to increase marine production. However, both issues should be planned together in order to move in the same direction and to be mutually supportive. This means that the government should plan to increase marine production in the long-term by the conservation and rehabilitation of marine resources, to ensure that they will continue to be productive. The government should also have clear plans to support artisanal fishermen in this new role of taking care and protecting resources in the coastal areas. Any activities that work against the plans should be banned; these would include: the issue of mangrove forest concessions for charcoal making and tiger prawn farming which is damaging the mangrove forests and the coastal areas. Trawling and push netting operations, which damage the fishing grounds and destroy fish stock, should also be prohibited.

3.3.2 Closed access to the area and delegation of authority to local fishermen

In Thailand, fisheries have been conducted under an open access regime. No one has the exclusive use or right over areas and fisheries resources. The current fishery laws under an open access regime have been found not to protect the sea from the rapid growth of the fishery industry, which in turn has led to the depletion of the fisheries resources, conflict over the use of resources and so on. Punishments for illegal fishing are much lower than the benefit that the fishermen may get from illegal fishing practices. In addition, current implementation of law enforcement by the government has been insufficiently effective to stop illegal fishing practices. In the last three decades it has become evident that sustainability of marine fisheries resources has not been well maintained. The users do not have a sense of ownership over the environment and fisheries resources. The challenge is to find an approach of husbanding and conserving these resources.

In fishery management in the past, fishermen were forced to follow the fishery laws and regulations; seasonal closures, mesh size limits, fishing gear restrictions, etc. This way of management was not successful because there was no participation from the local fishermen who are considered as resource users in this management. The fishermen lack the sense of ownership of the marine resources. They are not only taking as much as they can from the sea, but also nobody takes care and accepts responsibility for the resources. Fishing right can be organized under the umbrella of a fishery management scenario. By granting fishing right to the fishermen, they will create their own management system, which can solve the problems of fishery management in the past. "Resource users are resource managers", is an approach that can allow fishery management to succeed. Involving local fishermen in the management can be achieved by encouraging and allowing them to participate in such activities. If they involve or participate in these activities, awareness of the need to sustain marine resources will be created as Jules N Pretty (1995) states that:

"One views community participation as a means to increase efficiency, the central notion being that if people are involved, then they are more likely to agree with and support the new

development or service. The other sees community participation as a right, in which the main aim is to initiate mobilization for collective action, empowerment and institution building."

The concept of **resource users as resource managers** makes sense because it gives the fishermen an interest to ensure long-term productivity, stability, sustainability, and maintenance of fisheries resources and bio-diversity. Such a strategy is logical and should be considered as a possible approach to the achievement of sustainable and responsible fisheries. Thus, it can be implied that authority to manage coastal fisheries resources as exclusive fishing rights in cooperation with the government and other related organizations should be delegated to local fishermen or in practical terms to a group of fishermen, whose lives depend upon it. Being local people, they understand nature's signals of distress and the seasonally changing nuances as they apply to their specific waters. Ownership of the rights to the resources will generate recognition of the need to preserve the resources, or possible improvement of the local area and provide a sharp focus on the long-term sustainability of coastal fisheries.

In the fishery villages the local fishermen must help to conserve the coastal resources in front of their villages by stopping the use of illegal fishing gear. However, they have often found that it is difficult to stop other fishermen who still use the fishing gear because they have no right to do. If they cannot stop them, the problem of declining of marine resources will not be solved. Local fishermen need the **Right** to protect the sea. However, this should not be interpreted that they require the authorities to investigate and arrest fishermen who practice illegal fishing. They just need acceptance from other fishermen who are damaging the sea that they have the authority to protect the resources used by their villages.

3.3.3 Spread system throughout the country

Due to the migratory nature of some marine resources, management of the coastal fishery resources cannot be done by an individual fisherman or a village within a particular area. A fishing right system must be applied throughout the country. Bang Saphan is the first area for project implementation and it should expand to the upper and lower parts of Bang Saphan Bay. By following this direction it also reduces conflict between fishermen from inside and outside the project area. Other fishermen can learn from the experiences of the fishermen in Bang Saphan Bay.

3.3.4 Strengthening fishery extension system

There is one reason why Bang Saphan Bay is selected for the project site, it is because of the district officer, who are considered as extension officers, of Bang Saphan Noi district are willing to make changes and develop the living standards of fishermen in his area of responsibility. It means that the willingness and sense of responsibility of district officers is a factor for the success of project implementation. Due to the existing structure of DOF, district officers are under the command of provincial officers, but the duty to implement the Fishing Rights project is under the command of central government. They may or may not work seriously on the project, if the fishing right is not recognized at the provincial level. To lead and conduct the project especially at the initial stage, district officers play a very important role to prepare fishermen to be ready and able to run the system by themselves in the future, this may take a few years of hard work.

If the project depends only upon the responsibility and willingness of district officers without a proper structure of DOF, it may present some difficulty to expand the project in the future. The structure of DOF should support the implementation of fishing right. Fishing right should be added into the national fishery policy, accepted by all levels of officers, at policy maker level, management level, provincial level and district level. District officers, especially, should understand the importance and concept of the fishing right and have clear plans to implement it.

3.4 Associated regulations and administration to compose the system

3.4.1 Regulations associated with the fishing right

In the previous chapter, we discussed about a national policy to introduce the fishing right to the nation and to enact a law directly relevant to this right. Accompanied with enactment, it is envisaged that subordinate laws or regulations at administration level, as well as localized rules at fisher organization level, will be required to implement the fishing right. These supporting juridical, administrative or local regulations composing a system of fishing rights should also be studied.

(1) Rule to exercise the fishing right

It is assumed that the fishing right is to be granted to a fisher organization, in the case of the pilot project, to a fishery cooperative to be organized in the course of the project. The fisher organization will be obliged to allow individual member fishermen to practice fishing in the demarcated area properly so that the organization can manage the fishery resources to meet the purposes of the fishing right. Thus, the fisher organization needs to provide a rule to regulate resource utilization by member fishermen. We should note that, only with this rule, the original purpose of the fishery resource management can be achieved. In this regard, it forms a core part of the whole fishing right system, but still can keep locality. In other words, we can say simply that the purpose of the fishing right relevant law is to authorize fisher organizations to make this rule. In this rule to exercise the fishing right, for an example, the following points can be regulated;

- 1) Qualification of fisherman to use the resource (limiting users to local residents, specifying fishing method to be used, providing the years of its experience to clarify dependency for livelihood, and others),
- 2) Duration of fishing season if necessary, limitation of fishing grounds, limitation of fishing gear, and other ways to manage the resource.

It is apparent that the rule to exercise the fishing right should be based upon a consensus among the member fishermen, while involvement of the responsible administration in the regulatory process of the rule can take various forms or methods. In case of the Japanese fishing right system, the rule to exercise the fishing right is subject to the approval of a prefecture governor.

(2) Formulation of a utilization plan for the fishing ground

We also assume the fishing right is granted with validity for a certain period of time. In several years when the right expires, the administration qualifies applications for the fishing right and grants it according to the qualification conditions and priorities.

This renewal gives a good chance to reconsider how to utilize the fishing grounds in the demarcated waters under the right, especially in the case that several fishing rights can be granted for various fishing types and aquaculture. It may be suggested in such a case that the administration in the country or at provincial level formulate a utilization plan of fishing ground that incorporates the opinion of fishermen and scientific knowledge and publish it prior to the application of the renewal. The government cannot stop renewal without clear reasons, and the reasons should be related to the problems of management of the system of that particular fishers' group. In the case that other sectors want to use the area for other purposes, the government should give the top priority to the fishery sector and local fishermen.

(3) Local fishery consultative committee

For any decision on the granting or renewal of fishing rights and formulation of a utilization plan for the fishing grounds, so as to democratize its administration process, a local fishery consultative committee at provincial or district level may be suggested. The committee members will be comprised, for example, of elected fishermen, selected scientists and representatives from municipalities. Upon a request for consultation, the committee will advise the necessary things on grant, limit, and the cancellation of the fishing right, and instruct appropriate fishery management or arbitrate conflicts among fishermen. Rules to regulate the committee organization and its activity can be incorporated into the fishing right relevant law.

3.4.2 Registration of fishing boats

In Thailand, commercial fishing boats are registered by the port authority. In the case of small-scale fishing boats, however, there is no registration system at present. It is suggested to replace the current registration of fishing gear with registration of fishing boats of all sizes under one authority, the DOF, so that control of fishing pressure on the resources can be organized more easily. Various statistics work that includes boats, their fishing gear, catch volume and landing amount will also be able to be conducted by this unification. For the fishing right fishery, after the fishing right is granted to fisher organizations, number and type of fishing gear can be controlled by themselves under their rule to exercise the fishing right. For licensed fishery, any change of the restriction on fishing grounds and fishing seasons can be notified to owners more strictly at the time of renewal of boat registration.

3.5 Action plans and research subjects

3.5.1 Action plans

As shown in the future plan under the fishing right project (Chapter 2. para 2.3), the DOF will undertake various programs towards the establishment of a fishery cooperative at the project site and decentralization of fishery management to the communities. These programs include the extension of artificial reefs, propagation of the juveniles of useful species, and support for cooperative businesses (aquaculture, fish processing, and others). In the course of the implementation of these programs, the DOF must train their key personnel and conduct several supportive researches so as to develop the necessary details of the fishing right system that meet fishery resources and fishing practices in the coastal fishery at the project site.

3.5.2 Human resource development

(1) Training of the DOF extension officers

One of the essential roles of the DOF working team for the pilot project has been, and will be, the extension services to disseminate the necessary knowledge and information on resource management, fishing right system, and the fishery cooperative to the fishermen at the project site. Training of the officers in charge for specific subjects of the extension services will be required, which includes basic and advanced knowledge on fishing right and fishery cooperatives, extension service methodology and media development technology. Among these training subjects, we believe training on the following two subjects will have higher priorities, as this work must be undertaken at the earliest opportunity.

(2) Research work system participated in by local fisher groups

The extension or project officers must work to build up a sort of network to connect the fishermen and the researchers in Upper Gulf Marine Fishery Development Center. Firstly, the extension officers locate, through their daily services, the "information demands" of fishermen, what kind of scientific information they need to know on the fishery resources or oceanographic conditions in fishing grounds. Secondly, questions are then transferred to the researchers, and replies or study results are given back to the fishermen. This two-way service of extension will undoubtedly be required for community-based fishery management. To train the officers in this way, we believe that a series of the case studies on actual examples by them will be effective.

(3) Improvement of fisher household management

One of the main objectives of the pilot project includes the improvement of living conditions of fishery households at the site. To reduce production costs and increase fishery sales, firstly we need to know details of these breakdowns, as well as of other household account expenses. Thus, the extension officers will ask volunteer fishers to record in a household account book, expense categories which are carefully itemized so that they can, upon looking at their account books, suggest to fishers of necessary points for improvement. This consultative or guidance work can be included in the extension services. To acquire household management skills and account knowledge, the officers will need to be trained for these subjects both in theory and practice and to have working experience at a deeper level in the extension services.

3.5.3 Supportive researches

(1) Feasibility study for the set net project

Set nets of a larger scale cannot be operated by individual fishermen, as it occupies a certain area of the waters for a long time where good catches by other fisheries are also expected and it needs labor force that individuals usually cannot afford. For these reasons, the set net is generally considered to be suitable for community-based fishery, especially for newly organized fishery cooperatives as one of its financial sources. It is also considered to give fishermen an incentive and motivation to participate in collaborative work in their cooperative.

As fishermen in the Bay are aware, occasional rocky bottoms of the Bang Saphan Bay may be obstacles when a shallow water type set net is installed there, as it is difficult to pile bamboo into the bottom. In addition, as the Bay is wide at the

mouth, the inner sea condition can be rough sometimes even in seasons other than the NE monsoon. In the case of the project site, it will be necessary to design a set net of the open sea type with a rigid construction used with floats and anchors. Site studies should be conducted to locate an appropriate position to install the set net where a good catch can be expected, and where unacceptable obstacles to the existing fisheries in the Bay are not caused.

It will also be required to study the availability of net materials in Thailand, a reason for this comes from the necessity of cost and benefit analysis. In assembling a set net of this kind, netting of larger diameter twine is generally used. If a webbing machine, capable of producing such netting of various designed mesh sizes, is not available in the domestic net factories, net materials must be imported, which means a higher initial investment and maintenance costs.

(2) Fishery resource research

A series of researches for the fishery resources at the project site will be required. The present main products in the small-scale fishery sector in the Bay are swimming crab, squid, Indo-pacific mackerel, shrimp (southern area) and reef fish. As one of the base-line studies, it may be suggested to conduct a study on the catch and fishing efforts for these fisheries at their present level. To prepare for the fishery management under the project, spawning season of swimming crab, by-catch of anchovy luring light cast net, and the biology and resource of *sai-mai* can also be valuable study subjects.

(3) Study on artificial reefs

Some fishermen in the Bay told us that "after the installation of the artificial reefs, shrimp can not be caught in the inner Bay anymore as the current pattern was changed by the artificial reefs". Prior to the planned artificial reef installation in the southern area, it may be suggested, if possible in terms of the time schedule, to conduct a simulation study on how the steady and tidal currents are changed, or not, with the planned installation work and to disseminate the results to the fishermen.

Other fishermen said that their gillnets are sometimes entangled and damaged by the artificial reefs. It is said, as shown in one of the experiences in Japan, that artificial reefs of a rectangular shape may cause similar accidents and, in the area where gillnets fishing is dominant, artificial reefs of round corner type ("turtle" type) are sometimes used. For any further programs of artificial reefs, a basic design study on the shape of artificial reefs is suggested.

(4) Feasibility study on fish marketing

To enable joint fish marketing by fishermen, a series of studies on local markets for fresh and processed marine products is strongly suggested. The overall scope of these studies should cover a base-line study, market study and management study.

As study items, the base-line study should include, the present basis for main fish species, beach and local retail market prices with seasonal variance, transaction volumes, numbers of middlemen at the project site, their distribution channels, numbers and amounts of loans to fishermen. Market studies should include, dominant middlemen at the project site, destination of their goods, volume of transport, manner of transaction in wholesale markets, and others. Management

studies should include a feasibility study on any auction systems with the middlemen and on direct marketing, accompanied with cost and profit analysis, as well as fisher household income and expenses analysis that may be conducted through the extension services as mentioned in Chapter 3. para 3.5.2.

In addition to the above, it will be useful to study the failures of fish marketing businesses that were common in existing fishery cooperatives in Thailand. In the precedent study¹⁰, we can understand the basic information on the status of the fishery cooperative management in the nation. It may be suggested, for supplying necessary information to the current pilot project, to conduct a study focused on these business failures. That is to say; what conditions caused the failures, among the various factors that include, ways of auction and transaction (purchase basis or consignment basis), ways of account settlement with fishers and middlemen, volumes of transaction and stock, available distribution channels, cash flow, and financial management.

¹⁰ "The Role of Fishery Cooperatives in Promoting Sustainable Coastal Fisheries in Thailand", FAO, 1997

CHAPTER 4 COLLABORATION BETWEEN SEAFDEC/TD AND DOF OF THAILAND FOR THE FISHING RIGHT PILOT PROJECT IN BANG SAPHAN BAY

4.1 SEAFDEC policy and roles in management for sustainable coastal fisheries in Southeast Asia

It is mentioned in the SEAFDEC policy on Management for Sustainable Coastal Fisheries in Southeast Asia that, as a result of the Regional Workshop on Coastal Fisheries Management based on Southeast Asian fisheries that was organized by SEAFDEC in November 1996, It was obvious that members of regional countries recognized the increasing necessity of action for sustainable coastal management systems, i.e. community-based fisheries management (CBFM) and co-management. **A participatory approach to be developed to fit the circumstances of each country must be given high priority in coastal fisheries management.** Coastal Fisheries Management integrated with influencing factors is necessary for sustainable use and conservation of coastal resources. Co-operation among the people concerned, i.e. a co-ordinating body composed of experts at national and regional levels to give incentive to the sustainability of resources and the environment.

The SEAFDEC Special Consultative Meeting organized in December 1997, affirmed in its Strategic Plan that coastal states must mobilize support from other states to effectively safeguard against unfair treatment which may jeopardize national or regional sustainable fisheries development. Therefore, the question of the sustainable use of fishery resources needs to be addressed adequately, because Asia cannot readily turn to other sources of animal protein, and that fisheries development provides a firm guarantee for the continued availability of a dependable food source, which must be safely secured.

SEAFDEC as a regional organization actively involves itself in sustainable fisheries development and should act as a focal point or a regional collaborative platform for all its members, in promoting regionally beneficial research, information exchange and training programs concerned with suitable methods for sustainable coastal fisheries management. SEAFDEC should be the regional platform interchanging and promoting useful experience in terms of suitable approaches to coastal fisheries management between member countries. By doing this, SEAFDEC will help each country to clarify and define its direction and to develop mechanisms in integrated coastal fisheries management.

4.2 What SEAFDEC should collaborate with the Fishing Right Pilot Project in Bang Saphan Bay?

4.2.1 General view of collaboration

Implementing the Fishing Right project in Bang Saphan Bay is the first opportunity for SEAFDEC and DOF to gain experience and knowledge of the system. The outcome of the project will not only be of benefit to Thailand alone, it must be extended to the region. The project will provide us, the knowledge on how the system should be implemented locally and which procedure the system should follow.

The collaboration between SEAFDEC and DOF should be based upon the objective of finding a fishing right system that is suitable and which will be sustained, and fitted to the local conditions. DOF should conduct sub-projects to support the benefit at national level, but SEAFDEC will conduct or collaborate in sub-projects, which have benefit at regional level. Contributions from SEAFDEC to the project should be based upon our expertise and existing facilities at Training Department, these can be in kind, or in financial contribution.

To create viable and beneficial systems the initiative must come, not only from Thailand and SEAFDEC, but must be a perceived need by other countries needing similar projects. SEAFDEC cannot act alone in such projects, it must have the wholehearted support from the interested nations.

4.2.2 Collaborative activities

According to the SEAFDEC policy on Management for Sustainable Coastal Fisheries in Southeast Asia, and the technical competence of SEAFDEC Training Department, there are 3 aspects in which SEAFDEC can collaborate with the Thai Department of Fisheries in the Bang Saphan Bay, Fishing Right Project.

(1) Research Study

1) Study of the fishing right system

Apart from Japan, a Fishing Rights concept, which applies to marine fishery has not been introduced in any country. This concept has been discussed among the Southeast Asian countries for many years, but no country implemented it or tried to introduce an appropriate system to fit to the region and its country.

In 1999 DOF of Thailand, started to implement a fishing rights concept, which applies to marine fishery in Bang Saphan Bay as a pilot project. It took several years for the project manager, the district fishery officer and other related staff to study the concept and prepare the fishermen in the project area to be ready for the project. DOF have demarcated the project area and prohibited some fishing gear, which are considered to damage the marine resources, in the area since the 19 October 1999.

As the role of SEAFDEC is to promote a proper approach for sustainable coastal fishery development for the member countries, fishing rights are being considered as one of several components of the approach. SEAFDEC should conduct research studies on "the implementation of a fishing rights system which is suited to the local conditions". The research study should be conducted in line with the implementation of the system by the Thai DOF. The study should focus on 4 main areas.

- a) Fishing structure and utilization of resources
- b) Fisher organizations in the system
- c) Relevant laws and regulations
- d) Improvement of fishermen's living standards.

2) Research on marine resources and fishing gear

As mentioned in Chapter 3. para. 3.3.5, research studies on marine resources, i.e. spawning seasons for swimming crab, by-catch of anchovy luring light cast

net and biology and abundance of *sai-mai*, set net fishing gear and artificial reefs are needed to support the overall picture of this project in the long-term. For these types of research study, researchers of SEAFDEC/TD are competent to collaborate on them. SEAFDEC facilities; training vessel M.V. Platoon and oceanographic equipment, Remotely Operating Vehicle (ROV) etc. Co-research projects on the above topics can be conducted under the collaboration between SEAFDEC and DOF.

Before the Collaborative Research Project started, many types of fishing gear and fishing ground research projects of research division were conducted within the coastal area by M.V. Platoon and M.V. Plalung in Thai waters. By collaborating with DOF, and repeating these research projects this will give clear direction and will contribute to coastal resource management.

(2) Human resource development

During an interview with the project leader and manager, human resource development was mentioned and was considered to be the first priority. They said that “their officers need to be trained to be capable enough to manage the project, and to carry the project a step further. To conduct the necessary research, to promote the project to the officers at a higher level, and to gain knowledge and skills relative to sustainable fishing gear technology.”

As the training department of SEAFDEC, TD can contribute both knowledge and expertise to the project, we can provide resource persons when the training, for fishermen or officers, is organized in the field. It is also possible to invite project officers to attend relevant training courses organized at SEAFDEC/TD, i.e. The Marine Fishery Extension Course and Responsible Fishing Technology.

(3) Information dissemination

The Fishing Rights concept should be promoted at national and regional levels. Policy makers of each country in the region should recognize the value of involving local fishermen in managing fishery resources. A Fishing Rights System is a tangible system, which presents the details of how local fishermen can be involved in fishery resources management. SEAFDEC should also open the floor for the fishery management experts to brainstorm and discuss improvements to this pilot project and better systems for other areas. To try first in Thailand can be very useful to the region and will give several valuable pointers to the best system.

SEAFDEC can promote the project details by any available means that SEAFDEC has at hand, i.e. SEAFDEC homepage, newsletter or technical reports. The targets for this promotion are the nation decision-making mechanisms, the officers administering the project and the artisanal fishermen actually subjected to the rights system. To achieve these aims the types and content of the promotion may be different for each target group.

CHAPTER 5 IMPLEMENTATION OF THE FISHING RIGHT SYSTEM IN SOUTHEAST ASIA

5.1 Precedent cases in the region

It is desirable to collect information on the trial, successful or unsuccessful cases of the fishing right system and fishery cooperatives in the regional and neighboring countries are important. This data collection aims to increase our understanding of the fishing right system conjoined with or without a fishery cooperative. If there are more examples we can understand about actual situations, the better and deeper understanding we can achieve. The system appears to be an effective tool, in so that it can keep its locality on course for the implementation to attaining a final goal, between community-based fishery management, management of sustainable coastal fisheries, and responsible fishing for coastal fishery management. Our main concern would rather be on how the system can be functional in a coastal fishery structure that has been already been developed historically, or how the administration can fit it into the a fishery society.

We have learned that, in some small-scale fisheries or aquaculture centers in Song khla and Trang Provinces in Thailand, fishing or aquaculture operations in an exclusive form are being practiced on a legal or illegal basis. We also observed, during our field trip that the study at the village of Phang Nga Bay, a large number of set nets of a shallow water type are operated in the waters in front of the village beach. This is apparently an illegal case, as they occupy the waters for a long time without any juridical authorization, though these seemed not to give any disadvantage to others, as the area is shallow and not adequate for boat fishing. These fishermen have already started to exercise their fishing "right", these cases seem not to give us useful information, as their fishing operation was initiated without any administrative or juridical process.

Only one example can be found in Japan for a fishing right system that is working in the whole nation under a juridical structure. Because of its long history (90 years after it was given, it is the basis of the modern juridical system) and an extent of scale (around 3,000 local fisher organizations to manage the fishing right), the Japanese fishing right system can give us useful information on various aspects to study for this purpose. Apart from its applicability, or otherwise to other nations, it seems to us that the case in Japan may offer us diversification of the facilities of a vast experimental laboratory. We can get practical answers to our questions, so long as we ask the right questions.

5.2 Conceptual framework

5.2.1 To start the system

We started our study work by assuming four basic conditions to *start* the fishing right system; ①utilization of fishery resources, ②tolerable conflicts, ③management ability of the fisher organization, and ④administration initiative. Now, after completing our study, we believe these four issues are the necessary conditions to start the system. If any one of these is insufficient or is lacking, it will be extremely difficult to start the system, and no other conditions are needed. It was rather difficult for us to imagine other possible conditions. The second condition can be included in the first condition in the manner of a study if it gives a clearer view.

Among these four conditions, we foresee that the second condition “tolerable conflicts” may be the main issue in many countries in the region. In many cases in the region, conflicts among fishermen are observed in the form of the violation of relevant laws or regulations by either side of the fishery management bodies concerned. Illegal fishing is something that should be dealt with through regular law enforcement, and not through the fishing right system. We believe the system should not bear an unnecessary burden especially at a stage when it is going to be implemented.

As shown in case of the closed season for Indo-pacific mackerel in the Gulf of Thailand, the regulation works effectively, while, as shown in case of the ban on some fishing gear within 3 km of the shore in the country, the regulation does not work sometimes as expected. In this regard, we do not fully agree with an observation mentioned as “*The right regulatory and policy environment needs to be in place-and enforced- to ensure... The conditions needed for this is not yet (fully) in place among the countries in Southeast Asia*”¹¹.” Some rules can work under some conditions and some rules do not work under some conditions. Our concern should therefore be focused on which rules can work in the different social backgrounds of the states and how this difference comes about. In case of the pilot project at Bang Saphan Bay of Thailand, the law enforcement for the demarcated area has been carefully prepared through the efforts of the DOF officers. The demarcated area will be exposed to the first trial in the middle of May 2000, this will, we believe, give valuable experience to boost the project to more advanced stages.

5.2.2 To design the system

We found that, so as to draw up the overall scope of the fishing right system and to formulate its components, the above four conditions are not enough, except the first condition, ①utilization of fishery resources. The other three, ② to ④, did not give us enough hints to be able to study the issues.

When we studied an appropriate structure of fishing right, from the standpoints of area demarcation and the management body of the right, the fishery structure at the site found in our study on the above first condition, could give us some key ideas. When we studied, however, for example, the validity of the right or justifiability of property right and trade of the right, our field studies on these four conditions, as well as on other items listed in our study guidelines did not give us useful information. Thus we discussed these issues, based mainly upon our fundamental knowledge (in case of property right and trade of the right) or simply suspended it only by giving examples applied in precedent cases (in case of validity). Probably, these issues should be discussed within the scope of national policy, or more specifically, in a stream of status of the administration in a state or the nature of its society.

From our experience in this study, we feel the basic issues to *design* the fishing right system can be quite diverse in any country. At least, however, it needs to be ensured that the system should clarify a way of area demarcation and can include measures to keep the locality of the system itself.

¹¹ “Management of Fisheries, Coastal resources and Coastal Environment in Thailand”, ICLARM, 1999

5.2.3 Area demarcation

Area demarcation is deeply related to how the fishery resources are utilized by local fishermen¹². Where they have their fishing grounds, what kind of fishing gear is used to catch, and what species are targeted with this fishing gear. These conditions will compose core parts of the fishing right and hence can decide its main content. However, it is probably not so essential to specify the target resources to be placed under control by identifying some fish species or corresponding fishing gear, as these may be concluded reasonably or naturally as results of the local fishery structure. The key issue would rather be to establish a principal way to demarcate the fishing grounds. As we discussed in Chapter 3, para. 2, the area demarcation can be done in two ways, that is, a closed or open access system. In our case, it may be adequate to name the latter as “limited” open access system, as we assume that it gives a priority to community fisheries by setting up the fishing right.

It is suggested that applicability of both regimes should be clarified in a preliminary study from the following aspects; extent of the fishing grounds utilization by resident fishermen and outsiders, possibility of coordination to share the fishing grounds among resident fishermen as well as outsiders, and law enforcement effectiveness to protect the fishing right of the fishermen. All of these issues are directly related to the necessity to know whether the resource management by fishermen is possible or justifiable. As a matter of fact, the closed access regime seems to be an ideal or easier way to attain the community-based fishery management. However, a key point is how it can be attained without serious conflict with outsiders. We mean, conflict against legal fishing, not illegal ones. If the system is started without coordinating the conflict, this may cause social and political problems fatal to the system.

It is probable in most cases that the conflicts would arise with larger sizes of fishing boats, not with small sized boats, because the former has the need and hence the endurance to access many remote fishing grounds. If the conflict with them is serious and unavoidable, we would be forced to change the system design so that it can survive. It would be suggested in this case to transfer the subject fishing gear or target species from the fishing right system to the licensed fishery system and coordinate the sharing of the subject fishing ground under both systems.

5.2.4 Locality

The fishing right system must be based on local fishery conditions; that is, available fishery resources, fishing activities, status of fisher population and others. For example, if the qualification of the fisher to use a specified resource is based upon his/her annual operational days for such a resource, it should be regulated on a local basis. To say, in one community, the qualified operational days can be 100 days or more per year, but in another community, it can be only 80 days or more per year, according to their actual fishing activities. It would be virtually impossible to try to set up a national standard for this sort of fishing activity.

¹² It is natural to assume that ones who depend on the resource for their livelihood can manage it better than others. A management body can hence be comprised always only of the resident fishermen. Study on this subject will have to be conducted to know the relationship between resident fishermen and fishing grounds to be demarcated.

Thus, to have the fishing right system to fully suit such a local fishery structure, it is suggested to incorporate, in the relevant law, a mechanism to ensure that fisher organizations can make their own rules to manage the resources, based upon their experience and custom. As explained in Chapter 3, para. 4.1(1), this rule can form a core part of the whole system. We stress again that the objectives of the fishing right relevant law are to authorize fisher organizations to make this rule.

5.3 Preparatory work required

Extension services should be fully prepared for fishermen to understand about the concept of coastal fisher management and fishing right system, before checking the attitudes of the fishermen. It should also prepare fishermen to be ready for group working and to be familiar with problem solving process and community development activities.

A base-line study must be conducted to know, in addition to fishery statistics (such as catch volume, numbers of fishermen and fishing boats), the attitude, problems and concerns of the fishermen in coastal fishery management, as well as the possible contribution of the fishermen to the project. Before or after the base-line study, a preliminary survey (feasibility study) is suggested to be conducted to understand the basic conditions to design and start the system as mentioned above. Study methodologies for the preliminary survey must be discussed beforehand. We consider this kind of study, that is, one conducted in the course of a project to formulate or implement it, does not require data of precision at scientific level. It should be noted a project study is planned and conducted with different points of view from scientific research. By sacrificing, to some extent, data precision and applicability to other purposes, it can give us the practical and broader information needed for the purpose and can save our time as well. It is usual, in a stream of the line to prepare for or implement a project, to be difficult to have enough time to conduct and conclude the study results.

5.4 Policy framework on fishing right system

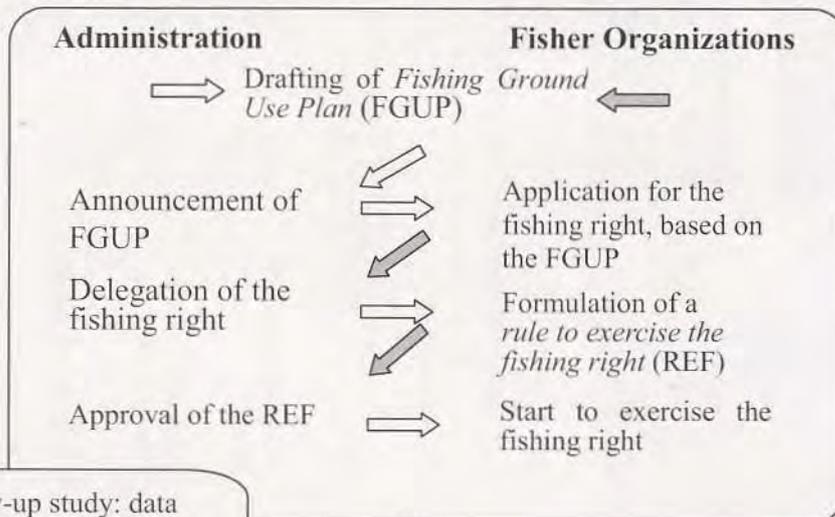
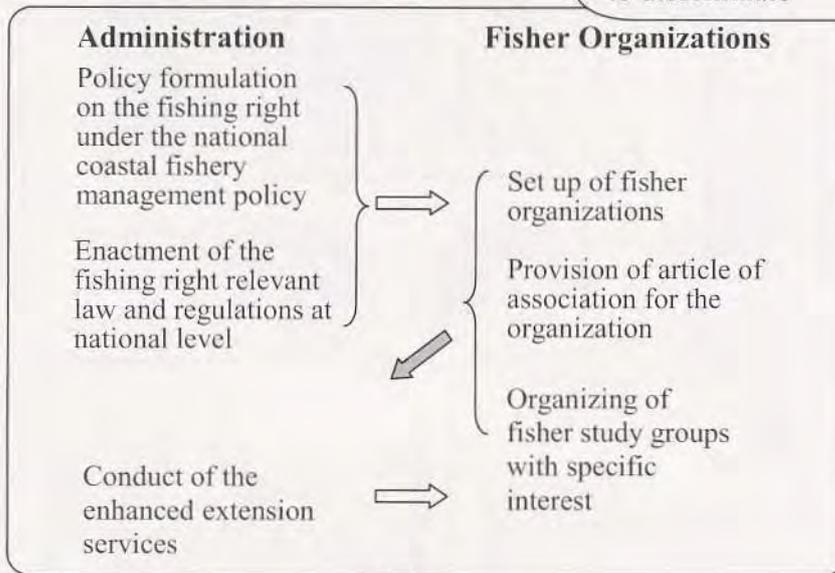
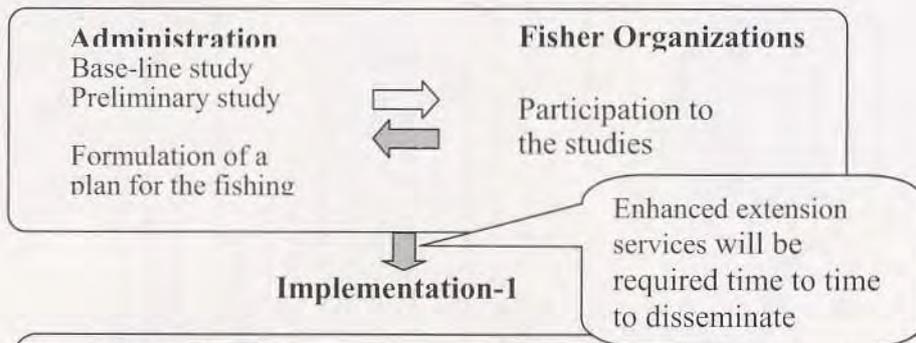
Decision-makers should have a clear view and policy that the fishing right system needs to include the partial delegation of administrative authority in the fishery sector to fishermen, as well as to local fishery coordination committees, if these are organized, so as to achieve resource management by fishers themselves. To support the system, the fishery administration may need to be strengthened especially in the area of fishing effort control. Effective systems for fishing boat registration will be required for both small and large boats in the coastal fishery to coordinate conflicts between fishing right fishery and licensed fishery. The system is subject to fisher organizations capable of managing the right. Undoubtedly, a fishery cooperative is the best way to organize fishers to achieve the objectives under CBFM. The promotion of fishery cooperatives can be included in the policy as parallel work conjoined with the development of the fishing right system.

5.5 Implementing process

General procedures to implement the fishing right system are shown as under;

GENERAL IMPLEMENTING PROCESS FOR THE FISHING RIGHT SYSTEM

Preparation

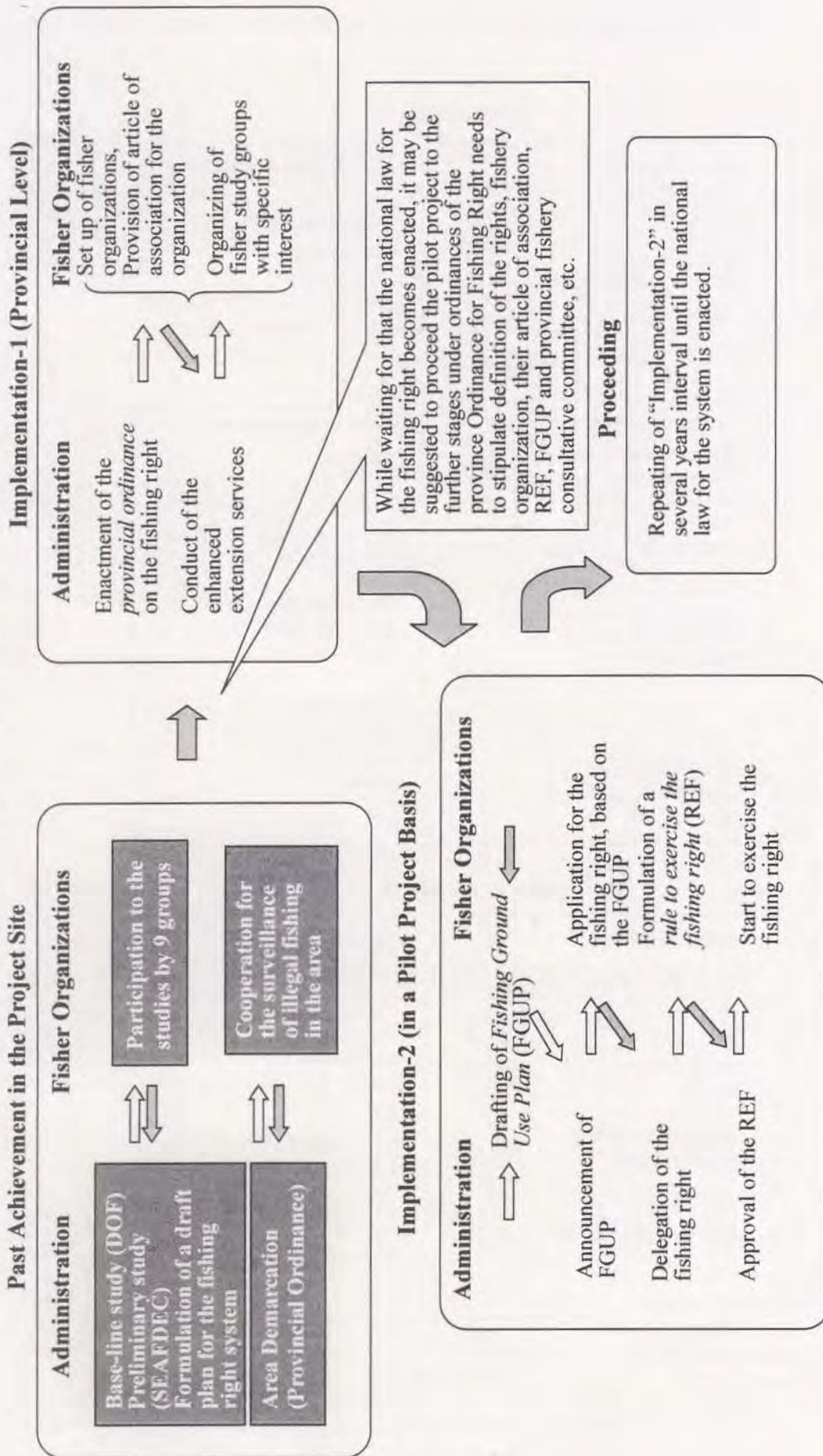


Follow-up study: data collection on change of fishery status under the fishing right system

Proceeding

Repeating of "Implementation-2" in several years interval

Suggested Implementing Process for the Pilot Project in Bang Saphan Bay



This diagram gives an example of ways to implement further stages of the pilot project in Bang Saphan Bay. As the area demarcation is one of the toughest parts to start the system and it could have been achieved already under the provincial ordinance, we believe the project can be proceeded to the next step.

CONCLUSIONS

During past several years, the current project in Bang Saphan Bay has been carefully taken care of by a project team of the DOF officers concerned. In view of utilization of fishery resources, possible conflicts in resident fishery and with non-resident fishery, managing ability of fisher organization, and initiative of administration, we can conclude that the project is feasible. As a first fishing right pilot project initiated under the control of a government in the region of Southeast Asia, it surely will give us valuable and practical information on the process of further development, so as to study how the fishing right system can take root in a real fishery society, and how it can contribute to achieve the community-based fishery management.

In course of the project, the fishing right will take a legislative form sooner or later. One of key issues will be demarcation of the waters where the fishing right is to be applied. It will be needed to clarify a government policy how to demarcate the fishing grounds, how and to whom the right should be granted. Residential fishermen should be considered as the first priority target to use the fishery resources. On the other hand, they also have to followed the regulation of utilizing and managing the resources of that demarcated area.

Moving from open access to close access system may create conflicts and be opposed by the fishermen who lose their benefit. It also take long time for the government to design a proper management plan and strategy which have to be accepted or compromised by the local fishermen within the area as well as with the outsider fishermen.

In case of the current project, the closed system will be applied. It has been started under the provincial ordinance. One fishing right covering gill net, trap, cast net and daytime purse seine is suggested to delegate. Classification of these may be needed to give the system more concrete foundation before the legislation process begins in state level. We noted that the details to configure the closed system (limit entry) need to be developed by the experience and study result of the pilot project before the fishing right is exercised nationwide in the state. We believe this should be suspended until enough information is obtained on the use of coastal fishing grounds by small-scale and commercial fishery.

As stressed above, it will be well worth while we continuing to watch the progress of the pilot project in Bang Saphan Bay. It is desirable for SEAFDEC to conduct further studies on the fishing right system that will be developed there, accompanied with progress of the project, and disseminate the results to the member countries.

In course of this study, we tried to find general conditions to start and design the fishing right system. Though these could be developed in a procedural way anyhow and presented in this report, the concepts should be tested and reinforced with other studies of similar research purpose. We wish it may have such chances. Among the conditions, we noted the area demarcation, closed or limited open access, can become a key issue in any state. It is suggested that applicability of both regimes should be clarified in a preliminary study. We need to know whether the resource management by fishermen is possible or justifiable when they can share, or need to reject to share, some of fishing

grounds with license fishery. Closed access regime seems to be a better or best way to attain the community-based fishery management. However, how it can be attained without serious conflicts against the licensed fishing boats? If the system is started without coordinating the conflict, this may cause social and political problems and these can be fatal to it.

LIST OF ANNEX

- Annex 1 Survey itinerary
- Annex 2 Name list of study team and interviewee
- Annex 3 Statistic tables on general and fishery information or data
- Annex 4 Results of the interview with fishermen in the Fishing Right Pilot Project
- Annex 5 Map of the pilot project and fishing ground maps of nine fishing villages
- Annex 6 Field survey photographs
- Annex 7 Survey checklist for the preliminary study on the Fishing Right Pilot Project

SURVEY ITINERARY

Date	Day	Hours	Working Records
Feb.27	Sun.	06:30 19:00	Lev. SEAFDEC/TD Arv. Phuket
28	Mon.	09:00-12:00 14:30-18:00	Meeting with ASFDC Director Interview with fisher group of Hard Sai Pleuk Hoi, visit to their cage culture facilities and shallow water set net.
29	Tue.	10:00-12:00 14:00-16:00 17:00-19:00	Interview with fisher group of Sam Chong Tai Visit to several fishing villages in Phuket Island Data compilation and Team discussion
Mar.01	Wed.	09:00-09:30 09:30 18:00 21:00-23:00	Reporting to ASFDC Director Lev. Phuket Arv. Bang Saphan Data compilation and Team discussion
02	Thr.	09:30-12:00 13:50-17:00 18:00-17:30 21:00-23:00	Interview with fisher group of Nong Samed Interview with fisher group called Fai Ta Presentation of the Fishing Rights Project in Bang Saphan Bay by Project leader Data compilation and Team discussion
03	Fri.	09:45-12:00 13:40-16:30 20:00-22:00	Interview with fisher group of Ao Yang Interview with fisher group of Pak Khlong of Bang Saphan Data compilation and Team discussion
04	Sat.	09:30-10:00 10:00-12:00 13:45-17:00 17:00-18:00	Visit to fish landing site of Nong Samed Discussion to Fishery District Office in Bang Saphan Noi. Discussion on law/regulation for conservation of fishery resources in the Bang Saphan Bay (Dr. Kato, Secretariat, joined the team around the noon) Interview with fisher group of Pak Khlong of Bang Saphan Noi Brief on the Fishing Rights Project in Bang Saphan Bay by Project leader and discussion on the project detail and collaboration with SEAFDEC/TD
05	Sun.	09:30-09:50 09:50-12:00 14:00-17:00	Visit to fish landing site of Nong Samed Discussion with Fishery District Officer (Dr. Kato left to Bangkok after the noon) Interview with fisher group of Bang Berd
06	Mon.	08:40-12:00 13:10-16:30 20:00-22:00	Data compilation and Team discussion Interview with fisher group of Chai Tha Lay Data compilation and Team discussion
07	Tue.	09:30-12:00 13:10-16:30 20:00-22:00	Interview with fisher group of Ban Kake Interview with fisher group of Phang Dang Data compilation and Group discussion
08	Wed.	09:00-12:00 13:00-16:00	Data compilation Visit to Fishery District Office for discussion and reporting
09	Thr.	07:00-07:30 09:00 10:00-11:20 16:20	Observation on fishermen and women activities, and landing site in Ban Pak Khlong Leave Bang Saphan Bay for SEAFDEC/TD Visit to Provincial Fishery Office and Department for Land Development in Prachuap Khiri khan Province Arv. SEAFDEC/TD

NAME LIST OF STUDY TEAM AND INTERVIEWEE

List of study team

- | | |
|--------------------------------|------------------------------------|
| 1. Dr. Yasuhisa Kato | Program Advisor |
| 2. Mr. Toyomitsu Terao | Project Advisor and Interviewer |
| 3. Ms. Supaporn Anuchiracheeva | Project leader and Interviewer |
| 4. Ms. Sumitra Ruangsivikul | Project Assistance and Interviewer |

List of interviewees

1. Project Officers
 - 1) Mr. Sakul Sukphonpan project manager
 - 2) Mr. Likit Boonsit project leader and
Bang Saphan Noi district officer
 - 3) Mr. Boonrod Jantub Bang Saphan district officer
 - 4) Mr. Somyos Leeprasertsin project staff
 - 5) Mr. Preecha Boripetch patrol officer

2. Fishermen
 - (1) Nong Samed fisher group
 - 1) Mr. Soonthorn Rosdi leader
 - 2) Mr. Surin Phrompachat asst. leader
 - 3) Mr. Kristna Krinnoi treasurer
 - 4) Mr. Pracha Chordokmai secretary
 - 5) Mr. Prayat Sae-sung fishermen

There were about another 3 fishermen attended the interview.

 - (2) Fai Tha fisher group
 - 1) Mr. Tip Runekaseam leader
 - 2) Mr. Vinai Chamchun asst. leader
 - 3) Mr. Lake Kumlungrang committee
 - 4) Mr. Charoong Yuthee committee
 - 5) Mr. Mana Khumnoi committee

There were about another 23 fishermen attended the interview.

 - (3) Ao Yang fisher group
 - 1) Mr. Sathean Yooyen subgroup leader
 - 2) Mr. Chaiya kumbung subgroup leader
 - 3) Ms. Nuan Chaleumwong subgroup leader
 - 4) Ms. Bualom Chaihuayha subgroup leader
 - 5) Mr. Sawang Thonghor subgroup leader

There were about another 5 fishermen attended the interview.

 - (4) Park Khlong Bang Saphan fisher group
 - 1) Mr. Niphon Phumpoung leader
 - 2) Mr. Thummanoon Surmsub asst. leader
 - 3) Mr. Nune Preabprank committee

- 4) Mr. Udom Muangsri committee
- 5) Ms. Chanram Sangsawang treasurer
- 6) Ms. Ramphung lukkune secretary

(5) Park Khlong Bang Saphan Noi fisher group
 There were about 30 fishermen attended the interview, (member of the group are 33 fishermen)

- (6) Bang Berd fisher group
- 1) Mr. Thongma Chaidee leader
 - 2) Mr. Kimleang Putmake asst. leader
 - 3) Mr. Somchai Khlongthrup treasurer
 - 4) Mr. Choechart Rattanaphong committee
 - 5) Mr. Prapart Sonsri fishermen
 - 6) Mr. Suthut Phatthong committee
 - 7) Ms. Runjuan Sriwirote committee
- There were about another 10 fishermen attend the interview

- (7) Chai Tha lay fisher group
- 1) Mr. Thongchai Kengthrong leader
 - 2) Mr. Somkoon Phengchan committee
 - 3) Mr. Somporn Tapepi boon committee
 - 4) Ms. Srinuan Sangchan secretary
 - 5) Mr. Suchart Uimnoi asst. leader
 - 6) Mr. Charoon Putmake committee
 - 7) Mr. Somchai Kengthrong committee
- There were about another 30 fishermen attend the interview

- (8) Ban Kake fisher group
- 1) Mr. Surin Macharuen leader
 - 2) Mr. Manop Auamlaor committee
 - 3) Mr. Chaovarit Moonmongkol committee
- There were about 15 committees and fishermen attended the interview.

- (9) Phang Dang fisher group
- 1) Mr. Somphong Kengthrong leader
 - 2) Mr. Visoot Kitsook committee
 - 3) Mr. Sayan Dangthae committee
- There were about another 4 fishermen attended the interview.

STATISTIC TABLES ON GENERAL AND FISHERY INFORMATION OR DATA

Table A.1 Area, Distance from Amphoe (district) to Changwat (province), Number of Municipalities, Sanitaries, Tambons, Villages and Dwellings by Amphoe: 1998

Amphoe/King Amphoe	Area (Sq. km.)	Distance from Amphoe to Changwat (k.m.)	Number of Municipalities	Number of Sanitaries	Number of Tambons	Number of Villages	Number of Dwellings
Total	6,357.62	-	2	13	48	413	136,576
Municipal area	86.25	-	2	-	3	-	27,476
Non municipal area	6,271.37	-	-	13	45	413	109,100
Muang Prachuap Khiri Khan	983.62	-	1	2	6	54	24,490
Municipal area	14.25	-	1	-	1	-	7,434
Non-municipal area	969.37	-	-	2	5	54	17,056
Kuiburi	575.00	30.00	-	1	6	47	9,877
Thap Sakae	518.00	42.00	-	1	6	65	13,965
Bang Saphan	876.00	76.00	-	3	7	70	18,314
Bang Saphan Noi	780.00	112.00	-	1	5	40	8,433
Pran Buri	826.00	57.00	-	2	6	41	21,481
Hua Hin	911.00	92.00	1	1	7	57	29,089
Municipal area	72.00	-	1	-	2	-	20,042
Non-municipal area	839.00	-	-	1	5	57	9,047
King Amphoe Sam Roi Yod	888.00	47.00	-	2	5	40	10,927

Source : Prachuap Khiri Khan Provincial Administration Office

Table A.2 Number of Population, Births, Deaths, In-Migrants, Out-Migrants, Rate of Population Change and Population Density by Area and Amphoe: 1998

Amphoe/King Amphoe	Total	Male	Female	Number of Births	Number of deaths	Number of In-migrants	Number of Out-migrants	Rate of Population change (from previous year)	Populations Density (per sq.km)
Total	473,335	240,902	232,433	6,348	2,409	27,251	23,084	0.95	74.45
Municipal area	58,968	29,007	29,961	2,743	407	4,469	5,341	0.05	683.69
Non-municipal area	414,367	211,895	202,472	3,605	2,002	22,782	17,743	1.08	66.07
Muang Prachuap Khiri Khan	86,294	43,414	42,880	1,681	450	5,087	4,695	0.87	87.73
Municipal area	18,417	9,022	9,395	1,647	112	1,603	2,526	0.35	1,292.42
Non-municipal area	67,877	34,392	33,485	34	338	3,484	2,169	1.02	70.02
Kui buri	42,177	20,810	21,367	182	232	1,838	1,352	0.48	73.35
Thap Sakae	54,325	27,105	27,220	457	248	2,424	2,352	0.23	104.87
Bang Saphan	68,023	34,465	33,558	937	353	3,208	2,880	1.06	77.65
Bang Saphan Noi	33,558	17,096	16,462	257	141	1,680	1,339	1.00	43.02
Pran Buri	72,027	39,866	32,161	1,192	334	5,455	4,495	1.60	87.20
Hua Hin	72,578	36,310	36,448	1,146	442	5,528	4,130	1.39	79.67
Municipal area	40,551	19,985	20,566	1,096	295	2,866	2,815	0.09	563.21
Non-municipal area	32,027	16,145	15,882	50	147	2,662	1,315	3.32	38.17
King Amphoe Sam Roi Yod	44,353	22,016	22,337	496	209	2,031	1,841	0.46	49.95

Source : Department of Local Administration, Ministry of Interior

Table A.3 Number of Employed Persons Aged 13 Years and Over by Industry and Sex Round 1 (February): 1999

Industry	Total	Male	Female
Total	242,093	133,517	108,576
Agriculture, Forestry, Hunting and Fishing	122,075	73,301	48,774
Mining and Quarrying	-	-	-
Manufacturing	27,855	14,438	13,417
Construction, Repair and Demolition	11,236	8,107	3,129
Electricity, Gas, Water and Sanitary Services	607	477	130
Commerce	36,177	14,781	21,396
Transport, Storage and Communication Services	9,965	8,890	1,075
Activities not inadequately described	34,177	13,522	20,655
	-	-	-

Note: All absolute figures are independently rounded; hence the group total may not always be equal to the sum of the individual figures
Source: Statistical Tables, The Labor Force Survey Round 1 (February) 1999, Provincial Level, National Statistical Office

Table A.4 Gross Provincial Product at Current Market Prices by Industrial Origin: 1992-1996

Industrial Origin	1992	1993	1994	1995	1996 p
Agriculture	6,452,569	5,495,903	6,416,925	6,854,144	7,461,928
Crops	2,787,765	2,426,036	2,641,676	3,038,064	3,547,581
Livestock	325,665	341,804	350,930	446,468	523,272
Fisheries	2,942,802	2,269,763	2,902,623	2,803,135	2,811,134
Forestry	-	-	1,376	727	381
Agricultural Services	29,147	22,916	23,344	25,517	22,708
Simple agri. processing products	367,190	435,389	496,976	540,233	556,852
Mining and quarrying	44,469	58,613	242,709	280,561	346,457
Manufacturing	4,379,510	4,841,615	5,356,237	6,399,230	7,546,904
Construction	1,694,705	1,288,927	2,064,844	2,089,763	1,963,117
Electricity and water supply	356,538	413,714	519,564	725,204	622,622
Transportation and communication	424,715	513,313	596,723	812,906	1,082,176
Wholesale and retail trade	2,707,358	2,997,856	3,414,637	3,862,396	4,049,941
Banking insurance and real estate	847,328	1,040,377	1,148,868	1,437,720	1,436,997
Ownership of dwellings	710,579	747,504	792,440	850,688	907,983
Public administration and defense	669,569	794,302	864,874	1,055,326	1,130,993
Services	1,685,267	1,843,183	2,322,152	2,628,905	3,005,793
Gross Provincial Product (GPP)	19,972,607	20,035,313	23,739,974	26,996,344	29,554,911
Per capita GPP (Baht)	47,554	47,253	55,467	62,493	67,786
Population (1,000 persons)	420	424	428	432	436

1996 p: Preliminary Data

Source: Office of the National Economic and Social Development Board

Table A.5 Average Monthly Income Per Household by Source of Income and Socio-Economic Class of Household: 1998

Socio-Economic Class of Household	Percent of Households	Average Household size	Total Income	Source of Income (Baht)						Other Money receipts
				Current Income			Property Income	Non-Money income ^{2/}		
				Wage & Salaries	Profits, non-farm ^{1/}	Profits, from farming			Current transfers	
All Households	100.00	3.5	10,017	3,738	2,619	1,787	417	100	1,279	56
Farm Operators	28.1	3.7	7,411	375	91	5,490	105	26	1,233	91
Own-Account, Non-Farm Employees	14.0	4.0	21,990	1,660	17,448	1,091	173	7	1,552	17
- Professional, Tech, Adm., Clerical, Sales, and Services	48.6	3.6	8,623	6,786	308	167	208	4	1,140	10
- Production, Farm and General Workers	17.1	3.7	13,451	10,754	668	113	461	-	1,455	-
Economically Inactive	31.5	3.5	6,001	4,631	112	197	71	6	968	16
	9.3	2.1	7,191	1,069	60	123	2,831	962	1,740	245

^{1/} Includes profits from roomers

^{2/} Includes rental value of owned home

Source: Report of the 1998 Household Socio-Economic Survey, Provincial Level, Prachuap Khiri Khan Provincial Statistical Office

Table A.6 Number and type of fishing gears used in the project site (1 February 2000)

Fisher's Group	No. of Vessel	Shrimp Gill Net	Bottom Gill Net	Fish Gill Net	Squid Trap	Fish Trap	Squid Luring Light	Trawler	Chinese Purse Seine	Day time Purse Seine	Anchovy Cast Net	Others
Ban Bang Berd	50	50	50	50	48	-	8	-	-	-	-	-
Ban Phang-Dang	32	32	32	32	-	-	-	-	-	-	-	-
Ban Chai Tha Lay	29	-	25	-	-	1	-	-	-	-	4	-
Ban Kae	20	-	1	-	-	-	17	-	-	-	17	1
Ban Park Khlong-Bang Saphan Noi	42	1	4	12	11	-	19	-	-	2	12	8
Ban Nong Samed	41	28	29	28	1	1	12	-	-	1	12	-
Ban Fai Tha	36	6	26	23	2	10	12	-	-	-	-	2
Ban Park Khlong Bang Saphan	82	28	28	28	-	-	17	3	-	1	21	-
Ban Ao-Yang	33	3	13	2	-	-	25	1	7	6	5	-
Total	365	148	208	175	62	12	110	4	7	10	71	11

Source: DOF, 2000

RESULT OF AN INTERVIEW WITH FISHERMEN IN THE FISHING RIGHT PILOT PROJECT

Bang Saphan and Bang Saphan Noi District, Prachuap Khiri Khan Province

Fisher Group: Ban Nong Samed Small-scale fishery group
Interview Date: 2 March 2000 (0900-1200 hrs.)
Address: Nong Samed Village, Moo 10, Bang Saphan Sub-district, Bang Saphan Noi District

General Information:

Ban Nong Samed is located near the center of the coast along Bang Saphan Bay. In the village, the DOF has installed an office for the current pilot project. In front of the office there is a concrete pier. Due to a larger crown height and lack of sheltered area, small-scale fishing boats do not use the pier, especially in NE monsoon season from October to January, and the small-scale boats are usually unloaded and moored in Chamung channel behind the coastal line near the project office. There are 120 households in the village. Most of the land in the village is state owned. Each household pays Bt.3 a year as levies to use the land. Electricity is supplied. Most of the households own TV receivers but do not have refrigerators. Freshwater is supplied from wells and drinking water is obtained from rainwater tanks. Village people conveniently receive public services from the social infrastructure like schools and hospitals in Bang Saphan and Bang Saphan Noi.

Fisher Group:

In 1998, the Fisher group was established to manage a revolving fund for fishing gear. Presently it holds 36¹ (?) members and 7 committees are organized. The amount of the fund has increased from the initial Bt.140,000 (supported by DOF) to the present Bt.200,000. Maximum loans of Bt.5,000 from the fund are available to members at a monthly interest of 2%, falling due in six months. 40% dividends are given to the members, 40% are reserved in the fund, 20% are given to the committees. All members are obliged to save Bt.100 per month in the fund.

Fishing Grounds & Fishing Methods:

A majority of fishing gear used by the fisher group members in Nong Samed are gillnets for swimming crab or fish. 6 households among the members are engaged in anchovy purse seining that is classified as commercial scale. According to a survey made by District Fishery Office in 2000, there are 12 anchovy or squid luring cast net boats in Nong Samed. In our interview at this village, the opinion of fishermen operating the luring cast net boats was not canvassed. Trap fishing for grouper or squid is practiced in the central waters at around 10 m depth in the Bay, that is, the waters between Mt. Mae Ramphung (a cape near the northern boundary of the project area, see project map) and Tha-lu Island (the largest Island among three Islands in the Bay). Near in Tha-lu Island, shrimp or crab gillnets are operated. Traps and gillnets are used mainly in February to September. Gillnets with a 2.5 cm mesh size and 50

¹ The numbers of nine villages' revolving fund member are cited from monthly report given by DOF

mesh depth for *Sillago spp.* are occasionally operated by the fishermen of Nong Samed along the coast to the north beyond Mt. Mae Ramphung, a day's round trip range from the middle of February to the middle of May. This is the closed season aimed at the larger-scale fishing boats to protect the spawning of the Indo-pacific mackerel.

It is not possible to load several different types of fishing gear on the boat at the same time. A fishing gear to be operated on the day is decided after checking the fish price. The catch volume of crab is a minimum of 5kg/trip to a maximum of 50kg/trip (rare) with an average of 10-20 kg./trip.

Usually the gillnet is operated by one fisherman and after landing the catch is removed by his wife and family members or relatives. Fishing boats and gear are the fisherman's own property. The small-scale boats are driven by long-tail OBMs with 5 to 13 PS. A new boat with engine costs between Bt.30,000 to 60,000. A set of swimming crab gillnet with 10cm mesh size and of 90m net length costs Bt.1,500, and mostly 8 to 10 sets are operated by one fishing boat. Due to the lack of enough mortgages, a bank loan service is not available. Thus, for investment, fishers borrow the necessary capital from the middlemen or moneylenders outside the village. Fishers pay back their loans without interest by selling their catch to the middlemen and the middlemen set the price. It is usual for fishers to purchase second or third hand fishing boats and engines which cost about Bt.25,000 .

As a traditional custom of fishing, fishers in Nong Samed do not fish on Buddhist religious days (the belief is not to kill any animal) and on Chinese New Year holidays (to celebrate their boats).

Product Price & Fish Marketing:

Fish prices at the beach (selling price to middlemen) is Bt.60/kg for large sizes of swimming crab (4-6 crabs/kg), Bt.40/kg for the smaller sizes (10 crabs/kg), Bt.100/kg for grouper (one fish/kg), Bt.20/kg for Indo-pacific mackerel (11-12 fishers/kg), Bt.80/kg for squid (1-2 squids/kg), Bt.80/kg for sea bass (one fish/kg), Bt.45/kg for sillago. The fishermen explained to the interviewer that these prices are a maximum. Two middlemen come from Bang Saphan and Ban Kood to collect the catch. Almost all the fishers are more than Bt.5,000 in debt to these two, but there is no interest payable. The catch is always priced by the middlemen at a low level, and fishers are obliged to sell their catch to them exclusively, except for selling a small quantity to the village people or tourists, but they are not allowed to sell, even small quantities to the market or other middleman. Income mostly depends on fishing in the majority of fisher household cases. A few households own coconut trees.

The Attitude of Fishermen toward the Pilot Project:

In answer to questions on the fishing right system, the fishermen said that they welcomed the system as they can take care of the resources in their fishing grounds themselves. They added that the current ban on the use of destructive fishing gear must continue because to withdraw it would cause unavoidable conflict between themselves and the commercial fishing boats.

In answer to another question on fishery resource management the fishermen stated that when spawning crabs are caught they wait the release of the eggs, (the eggs may be observed outside the shell of the crab) afterwards the crabs are harvested.

Problems and Concerns on Fisheries

The biggest problem for the fishers is that their fishing gear, traps, and trawls are destroyed or lost because of lost gear of the fishing operations by other fishing boats, mostly by larger boats using destructive fishing gear including trawl nets and anchovy purse seiners. If it this is witnessed the fishers can request compensation but it is actually very rare to find witnesses. Anchovy luring purse seiners from Tub Sakae, Prachuap Khiri Khan province are operated in the Bay, in the open season for the spawning Indo-pacific mackerel. The crews (most of them are Myanmar), illegal labor) stay in sheds built on the beach near their village. Some fishermen said that, after borrowing Bt.5,000 and buying a new fishing gear with it, the gear was lost in this way in only one night.

Fisher Group: Ban Park Pid (Fai Tha) Small-scale fishery group
Interview Date: 2 March 2000 (1300-1600 hrs.)
Address: Fai Tha Village, Moo 1, Phong Prasart Sub-district, Bang Saphan District

General Information:

The Fai Tha fisher group comprises members from several villages. The group leader and some core members live in the village of Ban Don . Ban Don is located in the middle of coconut plantations at the riverside of the upper reaches of the Bang Saphan Yai channel that opens into the river mouths in the northern inner part of the Bay. The Small-scale fishing boats of Ban Don are moored on the unprotected left bank of the riverside adjacent to the village. On the other side of the river, a few purse seiners can be observed being landed for repairs. An access road is used from Ban Don to the nearby main road, No.3374 connecting Bang Saphan and Bang Saphan Noi. Around 700 m of the access road running through the coconut plantations is unpaved but the remaining 300 m is paved.

Fisher Group:

Fai Tha fisher group was established in September 1999 starting initially with 20 members. There are around 36 members at present. The amount in the fund is Bt.100,000. Maximum loans of Bt.5,000 are available to the members at 2% monthly interest, with a three months grace period in the monsoon season. 40% dividends are given to the members, 40% are reserved in the fund and 20% are given to the committees. All the members are obliged to save Bt.50 per month in the fund.

Fishing Grounds & Fishing Methods:

Fishermen in this group are mostly engaged using swimming crab gillnets, fish gillnets and traps. Some fishermen operate cast nets with lure lights for squid (18 boats, according to the interview) or anchovy purse seine (2 boats). Gillnets for Indo-pacific mackerel are operated at 4 m to 20 m depths, but mostly at 12 m to 13 m depth, which runs from Mt. Mae Ramphung to Tha-lu Island roughly in a NNE direction. According to one of the interviewees in this group, other small fishing gear are operated in shallower waters, inside of the 12 to 13 m channels, or in other words,

inside the line connecting the cape and the Island. Gillnets for Indo-pacific mackerel are operated in either the bottom or surface layers. In case of the bottom gillnet, the net depth is 50 to 100 meshes deep depending on the water depth, and in case of the surface gillnet, the net depth is 70 meshes. In both cases, the mesh sizes are 4.5 cm to 4.7 cm.

For operations of the Indo-pacific mackerel gillnet, two sets of gillnets of Bt.6,000/set are used in case of one interviewee. The catch volume of mackerel varies widely from some 10 kg to one ton at a maximum. Mackerel gillnets need two fishermen to operate them, while other gillnets or traps can be handled by one man alone. The output power of the long tail OBM is 8 to 13 PS and the OAL of the fishing boat is around 6 m.

Product Price & Fish Marketing:

One middleman in Ban Park Khlong visits Ban Don to collect fish. Though around 20 kg of the catch can be marketed by fishers, a catch of more volume cannot be handled. Furthermore, there are no facilities to preserve fresh fish or to transport it. Hence, fishers depend on the middlemen for fish marketing. One of the interviewees said that he had no debt with the middleman and that once the middleman had offered him financial support, but he declined it, since he can borrow capital from the village people or his relatives. 10 households in the group hold coconuts plantations as their side business, but others depend only on fishing for their income.

Attitude of Fishermen toward the Pilot Project:

In reply to questions related to the fishing right system, fishermen in this group answered that they agree to ban destructive fishing operations; trawlers, luring light anchovy purse seiners etc. But they do not mind the fishing boats from other villages/districts visiting the project area to fish, if they respect the rules under the system and pay some fees. To another question on the sub-division of the project area in accordance with village boundaries, the fishermen answered that it would not be appropriate as it could cause conflict between the villages.

Problems and Concerns on Fisheries

Fishermen said they occasionally observe illegal fishing by means of using cyanide ("knocking fish") in the area near Tha-lu Island. One of the interviewees, who volunteered to be an informant for illegal fishing surveillance under the project using a walkie-talkie, said that he was once threatened by trawler fishermen and was told they would come back if the project is canceled. He feels that this creating a dangerous situation.

Fisher Group: Ban Ao Yang Small-scale fishery group
Interview Date: 3 March 2000 (0900-1200 hrs.)
Address: Ao Yang Village, Moo 3, Mae Ramphung Sub-district, Bang Saphan District

General Information:

The Fish landing site at Ao Yang is located at the innermost westerly side surrounded by the cape Mae Ramphung Mountain and provides a well-sheltered area against NE winds. Thus, in this site, larger fishing boats can be more easily observed, which

include those from other villages. There are two shore facilities giving a roofed space for fish handling and a concrete pier with suitable crown height for middle-scale fishing boats. The Ao Yang landing site is connected to the inter-provincial road No.4 with a two-lane paved road No.3169 through the town of Bang Saphan. In the vicinity of the Ao Yang landing site, there are few fisher's houses, despite the large number of members of the fisher group.

Fisher Group:

The Ao Yang fisher group was established in 1992 and has 120 members at present, and is organized into 10 sub-groups for more convenience in collecting loan repayments from members. The present amount in the revolving fund is Bt.400,000, greatly increased from the initial amount of Bt.100,000, though at one point the group almost collapsed due to the failure to collect some repayments of Bt.50,000. Loans of a maximum of Bt.5,000 in maximum are available subject to two guarantors. Members must pay a 2% monthly interest, falling due in five months. The maximum amount of the loan is considered too small by the members. All the members are obliged to save Bt.50 per month in the fund.

Fishing Grounds & Fishing Methods:

Some of the members are engaged in operating gillnets using small-scale fishing boats. More than half the fishing boats operated by members of this group use Chinese purse seines (18 crews or more), anchovy purse seines or anchovy cast nets using larger scale fishing boats. The interviewed fishermen consider that, if they operate a fishing boat with an overall length of 10 m or more and employ 7 to 8 crew, the boat belongs to the commercial fishery category. In the case of the purse seiners, as well as other larger boats, only the boat owner joins the group and the crew does not apply for membership. It may be judged that fishing boats in this group, other than gillnet and squid luring green light cast nets that can be operated by 2 to 3 crew, are commercial scale operations. In the Ao Yang group, there are no reports on fishing boats operating fish or squid traps. Some fishermen said that fish aquaculture in 20 cages or more is practiced near the landing site, though this could not be confirmed in our field study, other than a few idle cages that could be seen from the shore.

In the vicinity of Tha-lu Island, anchovy purse seines and cast nets are operated. Anchovy fishing, which we can assume is practiced mostly using cast nets because of the shallow depth. These are also operated in the inner Bay surrounded by the cape Mae Ramphung Mountain and three Islands, especially in area where the water depth is less than 15 m (within 3 km from shore) and near the rocky bottom, found approximately in the center of the Bay. Squid cast nets with lure lights are operated in the inner Bay generally. In case of gillnets for swimming crab or mackerel, the reported fishing grounds are mostly the same as the ones identified by fishermen in other villages, that is to say, the area of shallower waters inside the Bay in case of swimming crab, in the case of mackerel the area of nearby waters along a notional line connecting the cape and the Island.

The Attitude of Fishermen toward the Pilot Project:

In response to our questions on the fishing right system, one of the interviewees, who owns and operates a squid luring green light cast net boat, stated that he could not immediately answer, for the reason that the merits and demerits a fisherman may perceive from the project can differ largely depending on the type of his fishing gear.

Generally, he does not foresee any problem for swimming crab gillnets and mackerel gillnets if the project develops into further stages. However, the "possibility" of a ban on luring light for squid cast net concerns him, as well as a ban on anchovy fishing. He welcomes the ban on trawl fishing in the project area, but worries about how the government is going to deal with lure lights and anchovy fishing boats under the project. Juveniles of anchovy ("*sai-mai*" or "*khao-sarn*") have recently commanded a good market with higher prices than mature anchovy. Fishing grounds for *sai-mai* are found near the shore and fishing grounds for the grown anchovy are offshore. If anchovy fishing is totally banned in the Bay, the luring light cast net boat owner-operator said, he will have to return to the offshore fishing ground, beyond the project area boundary, where he used to fish for grown anchovy.

Fisher Group: Ban Park Khlong Bang Saphan Small-scale fishery group
Interview Date: 3 March 2000 (1330-1600 hrs.)
Address: Park Khlong Bang Saphan Village, Moo 5, Mae Ramphung, Bang Saphan District

General Information:

Around 3 km or less after passing the town of Bang Saphan toward the Bay beach, the road No.3169 reaches a well maintained two-lane paved road, running along the coast line of the Bay and is connected to No.3169 at a T-shaped intersection in the front of beach. Near this intersection, there are some tourism hotels and restaurants. Turning to the left at this intersection leads to Mae Ramphung Mountain and the landing site of Ao Yang, and turning to the right leads to Park Khlong Bang Saphan village, which is just a few minutes by car. Park Khlong Bang Saphan village is located at the mouth of the Bang Saphan Yai canal. The village and the front beach are separated by the above coast road, and at the beach side along the road, many sheds are to be seen, these give a roofed space for the weighing and packing of squid and anchovy after sun-drying them on net-covered lattices installed on beach behind the sheds.

Fisher Group:

The fisher group of Park Khlong Bang Saphan was established in 1995, and has a present membership of 51 members. The current value of the revolving fund is Bt.490,000. Loans of a maximum of Bt.20,000 are available for the members at a 2% monthly interest, falling due in 10 months. All the members are obliged to save Bt.100 per month in the fund. Among the members in this group, some fish middlemen and processors are given membership, and one of them is in charge of the accounts for the revolving fund.

Fishing Grounds & Fishing Methods:

The major fishing method in this group is squid or anchovy cast net, which are commonly used with luring lights and booms to suspend the nets, and thus can be used by the same boat by only changing fishing nets. For the operation of anchovy cast net, five crew are employed, and for squid cast net, 3 crew are employed. Some fishermen said their crews are mostly of Myanmar nationality. According to the results of our interview, 20 cast net boats are operated in the group. In addition to these, Several small-scale gillnet boats for crab and fish and 2 small trawlers with OAL of 9 m are operated.

Fishermen in this group said that generally bottom gillnets and mackerel gillnets are operated in the Bay, and the fishing grounds for gillnet boats move a bit offshore in a poor catch season. More specific answers were given when the fishers using squid cast nets were interviewed. Squid cast net boats of 7 m OAL are operated in the waters along a notional line connecting the cape of Mae Ramphung Mountain and Tha-lu Island. Boats of 7 to 12 m OAL are operated on the further offshore grounds beyond the line and up to a depth of 30 m. Anchovy cast nets are operated in the vicinity of the Islands. The trawlers operate near the shore. The fishermen said that, as the boat size of trawler is so small, these operations within 3 km from the shore are allowed, or tacitly permitted by the administration.

Attitude of Fishermen toward the Pilot Project:

In our questions relating to the pilot project, some cast net boat owners answered as follows. In their answers and opinions, some misunderstanding on the scope and purpose of the project were apparent. However, we recorded all of these just as the questions were answered. This allows knowledge on their attitude and their actual "understanding" of the project.

- We do not understand the reason why the project area must be closed against some types of fishing gear, and do not know when it was closed or what kind of the gear are actually banned.
- Not only the commercial fisheries cause damage to the small-scale fisheries, but also sometimes small-scale fishermen leave their traps at the fishing ground for a long time and, as a result of this, they occupy the waters selfishly.
- Our concern is how the fishing gear permissible for use in the project area should be decided. Fishermen operate more than one type of gear. All the fishing gear used in the Bay at present should be permitted.
- Now, if the big fishing boats are to be banished from the Bay. In the next step, the small fishing boats may be kicked out as well. We worry that the government intends to transform the Bay into a preserved area.

Problems and Concerns on Fisheries

When the artificial reefs were installed, we were not informed beforehand. We judge that the artificial reefs give us some problems. In their vicinity, it becomes impossible to set a shrimp gillnet, as it is entangled and sometimes damaged by the AR when we retrieve it. After the installation, there is almost no shrimp catch inside the Bay. Probably the current direction has been changed by the ARs. We can not use shrimp gill nets any more (opinion by one of the luring light cast net boat owners).

Trawlers are equipped with echo sounders, and they have already detected and marked the location of the artificial reefs on their navigational charts. Small-scale boats can not locate the artificial reefs. Initially the government had set marking buoys so that fishers could know the locations, the trawlers however have removed the buoys (opinion by one of the small-scale fishermen).

Fisher Group: Ban Park Khlong Bang Saphan Noi Small-scale fishery group
Interview Date: 4 March 2000 (1330-1600 hrs.)
Address: Park Khlong Bang Saphan Noi Village, Moo 3, Bang Saphan Sub-district, Bang Saphan Noi District

General Information:

The road No.3374 connects Bang Saphan and Bang Saphan Noi villages. Before reaching Bang Saphan Noi from Bang Saphan on the road No.3374, turning to the left at a point after passing Nong Samed, leads us to Park Khlong, Bang Saphan Noi. The village is located near the mouth of the Bang Saphan Noi canal and Tha-lu Island can be observed directly in front of the village. To the north near the river mouth, there are two channels with unprotected slopes with a width of several ten meters. These are used for anchoring the fishing boats of the village. A concrete pier exists at the end of the channels and there is a line of breakwater near the river mouth built by installing a similar concrete structure to the one for artificial reefs.

Fisher Group:

The fisher group of this village has 33 members. At the present the revolving fund is about 200,000 Baht. Though there are some non-member fishermen, the group expects the non-members will join them when the project progresses further. In this group, saving is not obligatory.

Fishing Grounds & Fishing Methods:

The fishermen in Park Khlong, Bang Saphan Noi, told us that the fishery resources in the southern half of the Bay are more plentiful than in the northern half, they reasoned that in the Bay the prevailing coastal current flows from the north to the south along the shore line. Thus their fishing is practiced mainly in the waters in front of their village, that is, in the southern half of the Bay and in the vicinity of three Islands. Indo-pacific mackerel gillnets are operated, as in other villages, in the waters near a notional line connecting the cape and the Island, but more in the southern part by the fishermen in this village. Squid cast nets are operated in the vicinity of the Islands. Swimming crab gillnets fishing grounds are in the southern half of the Bay. In terms of the number of fishing boats, the majority are represented by gillnet boats. The main fishery is however, supposed to be squid cast net boats and, the alternative fishing method is anchovy cast net. In the interview, the fishing grounds for anchovy cast net were not identified.

Product Price & Fish Marketing:

The landed catch, processed or unprocessed, is bought by three fish middlemen living in the village. Fishermen are in debt to these middlemen, without interest, but fish prices are lower. It is possible to sell the catch to the others. However, fishermen simply do not sell to anybody other than their middlemen, as they think it deviates from the traditional way. 20% of the fisher households have a secondary income from agriculture. When they are not able to fish for a longtime for example in monsoon season (October to December), the fishermen said that they usually repair their boats and fishing gear.

Attitude of Fishermen toward the Pilot Project:

In answer to our questions on the pilot project, the group leader said that the closed area has a good effect on the small-scale fishery as it prevent damage to their fishing

gear, and the project can also contribute to the resources recovery. For the anchovy cast nets, the project will cause problems. Some fishermen said that, as the Bay has exceptionally good fishing grounds, it may cause conflicts if the area is closed. Others had an opposite opinion and said that the area should not be allowed as open access to the project area even for small-scale fishery from outside. The group leader said that they returned the walkie-talkie to the DOF, as the risk was too high to the informant. He added that a mobile phone would be better to safely report illegal fishing to officers.

Fisher Group: Ban Bang Berd Small-scale fishery group
Interview Date: 5 March 2000 (1330-1600 hrs.)
Address: Bang Berd Village, Moo 5, Sai Thong Sub-district, Bang Saphan Noi District

General Information:

The village of Bang Berd is located on the cape of Bang Berd Mountain. Village houses are divided by the Mountain into two areas north and south of the cape. Bang Berd is the farthest village from towns of the district. The southern borderline (N10° 58'30") of the project area runs around the middle of the cape. This borderline is also the boundary between two provinces; Prachuap Khiri Khan and Chumporn. At the north side of the cape, a small inlet with a sandy beach provides fishing boats with good shelter, and thus some boats are anchored there or landed on the beach.

Fisher Group:

The fisher group of Bang Berd was established in 1992 and has 78 members at present. The revolving fund amount is Bt.400,000. Loans are available to the members at a maximum of Bt.6,000 with 2% monthly interest, falling due in 15 months. The members are obliged to make a saving of Bt.100 per month.

Fishing Grounds & Fishing Methods:

From Bang Berd to Tha-lu Island takes about two hours for a small-scale fishing boat equipped with a long tail OBM. This gives an example of the maximum operating range of the long tail boats, as fishermen of the village said the waters beyond Tha-lu Island are too far for fishing. Around one km from the shore, fishermen said they find rocky bottom along part of the coast from the Islands to the front of the cape of Bang Berd Mountain. In this area, seashells abound, as well as sea turtles that lay their eggs at Tha-lu Island. In the rocky bottom area, the gillnets are damaged by the bottom, mainly hook and line for grouper and sea bass is practiced. In the south of the village, shrimp gillnets are operated near shore until near the next village, Bang Tham Thong. Slightly offshore, in waters of more than 15 m depth, the bottom changes to sand or clay, and bottom gillnets, squid traps and squid luring cast nets are used from Tha-lu Island in the north to Bang Tham Thong in the south. Squid luring cast nets are operated at 30 m depth. There are no anchovy luring light cast net boats in this village. There were some fishermen in this village operating anchovy luring light cast nets, but since the project started in October 1999 these fishermen have changed their fishing gear to others that do not damage the fishery resources.

When the closed season for Indo-pacific mackerel is ended many purse seiners and pair trawlers come to the fishing grounds in front of the village. From Ban Kood, 20

to 30 fishing boats for Indo-pacific mackerel, equipped with echo sounders, visit the village and are engaged in fishing and fish landing. They stay at the village around 7 days. The area becomes congested with them like crowded markets. Small-scale fishing boats also come from neighboring villages, which the fishermen can accept. The problem is the commercial boats, the fishermen said.

Product Price & Fish Marketing:

Their catch is bought by two middlemen who live in the village. Fishermen are in debt to them and do not market their catch by themselves. Fish prices are set by the middlemen, but are lower reasonable prices.

Attitude of Fishermen toward the Pilot Project:

In answer to our questions on the fishing right system, the fishermen said that the system is for the purpose of protection against commercial boats, and the protection is by reporting illegal fishing, and enables the conservation of resources, by allowing the propagation of fry, for example.

The fishermen were informed at the planning stage of the locations of the boundaries of the project area, and they were told beforehand that the southern half of their fishing ground was not going to be covered by the project. They decided to accept the plan, because, if they did not agree with it, the project could not be implemented and thus even the northern half would not be protected.

Fisher Group: Ban Chai Tha Lay Small-scale fishery group
Interview Date: 6 March 2000 (1330-1600 hrs.)
Address: Chai Tha Lay Village, Moo 3, Sai Thong Sub-district, Bang Saphan Noi District

General Information:

The village of Chai Tha Lay is located about 3 to 4 km to the south of the river mouth of Bang Saphan Noi canal, and the front beach faces Sing Island, the middle one of the three Islands in the Bay. To anchor their fishing boats at the time of rough sea conditions, fishermen in Chai Tha Lay use either Bang Saphan Noi canal or the Phang Dang canal, around 1 km to the south. Both canals give shelter. The former gives enough depth for anchorage but is too far while the latter is nearer but the depth is shallow at the mouth.

Fisher Group:

The fisher group was established in 1998 at present the membership holders number 42. In this group, employed crew can be members, as well as the boat owners.

Fishing Grounds & Fishing Methods:

The major fishing gear are gillnets for Indo-pacific mackerel and swimming crab gillnets, and some operate anchovy luring light cast nets as well. Mackerel gillnets (mesh size 4.5 cm, net depth 70 to 100, net length 600 m) are operated in the waters to the east of Tha-lu Island, where the water depth is 25 m or more. Crab gillnets (mesh size 4.5", net depth 14, length 1,000 meshes) are operated in the southern waters near Tha-lu Island, where anchovy cast nets and fish traps are also practiced.

Product Price & Fish Marketing:

Among the members, there are three or four sub-middlemen who buy the catch from two or three permanent fishermen and sell it to middlemen. The middlemen sell it wholesale to the processing factories or cold storage behind Mt. Mae Ramphung. When enough are collected, the middlemen transport the fish to wholesale markets in Bangkok. Beach prices for fish are as the following table. When fishermen borrow money, they receive it in form of cash or fishing gear if this is the purpose of borrowing. Fishing gear can be purchased in the market of Bang Saphan Yai.

Fish species	Price/kg	Pieces/kg	Remarks
Squid	70 Bt.	2-3	Big size
Crab	60 Bt.	4-6	Big size
	45 Bt.	-	Mixed size
Mackerel	18 Bt.	12-14	
Grouper	80 Bt.	1	Dead
Grouper	200-300 Bt.	1	Alive

The Attitude of Fishermen toward the Pilot Project:

In answer to our questions on the fishing right system, the fishermen in this village replied that, the benefits of the system are that the fishery resources are recovered by band trawls, luring light purse seines and luring light cast nets and the small-scale fishery get protection and can operate more safely. For the current project, the group is involved in illegal fishing surveillance by means of walkie-talkies that were delivered to them five months ago. The fishermen said that they desire the success of the project and hope the law enforcement may be effective when the closed season for Indo-pacific mackerel is opened on 15 May this year. As for the acceptance of small-scale fishing boats from the outside, the fishermen said that they should use the same fishing gear as in the village if they want to use the fishing grounds here, though it will be hardly possible for them to visit here due to the distance.

Relative to their resource management, the fishermen said that the management will be done in collaboration between the government and the fishery cooperative, both sectors will coordinate the necessary requirements, law enforcement will be required, and the way of resource management should be regulated by the nine fisher groups in collaboration with the DOF. Another fisherman said, coordination with the government is crucial, and it will be difficult if only the local people manage the fishery resources. To our question on the necessary measures to conserve swimming crab resources as an example, a fisherman said that spawning crabs should be released. At present these are harvested, but if everybody agrees, they can keep to the rule. This will be possible without difficulty, as they have various voluntary services in the village. Other fisherman said that, as most of them are dead already when the net is hauled, the release of the spawning crabs is not an effective method. It would be much better to limit the fishing time during the spawning season of the swimming crab, since there may be peak periods in year for spawning or laying eggs.

The fishermen expect that, if the project is successful, the level of their living conditions can become higher. In answer to our questions on their willingness to enlarge their fishing boats if the capital is available, some answered that they do not want larger fishing boats as the size will be limited in the project area.

To our question on the past and present abundance of fishery resources in their fishing grounds, the fishermen answered as follows;

- As an example, 15 years ago, the net length was shorter than at present and the fishing grounds were nearer. At that time, schools of Indo-pacific mackerel could be seen within 3 km of the shore and Spanish Mackerel could be caught near the three Island. In the case of fish traps, 15 to 20 traps per fishing trip gave enough catch to feed his/her family, but at present, more than 100 traps per trip are used.
- About 10 years ago, 10 large purse seiners with processing plants onboard came and operated during the three seasons from July to August, and left to go elsewhere. After that, middle scale purse seiners started their operation and have continued it every season so far. Fishers in Bang Saphan Bay saw that outside fishermen are getting benefit from their fishing grounds. By that time they wanted to start anchovy fishing operations but at the same time the anchovy resources started to decline. The outside fishermen sold their fishing boats to fishers in Bang Saphan Bay and they still continue the fishing operation.
- Artificial reefs are useless as measures to prevent trawlers operating, but useful for enhancing the marine resources.
- The demarcated area under the project has many good fishing grounds. The sizes of crab are larger and fish qualities are better. If anchovy fishing can be prevented, it will become much better.
- Although prevention of anchovy fishing will cause conflicts, it is necessary.

Problems and Concerns on Fisheries

All the members have received fishing gear damage from the trawlers that come from the outside. Some went bankrupt due to the damage. The fishing gear damage has continued for 10 years or more. Purse seiners can cause damage, but less than trawlers. Trawlers come into the Bay from two different directions. On one direction, they enter the Bay from the cape Mt. Mae Ramphung and pass nearby the northern shore of Tha-lu Island and then turn to the NE to cross the center of the Bay. From another direction, they approach the Island from the south. After reaching a point to the south of the three Islands, they turn to the NE and pass near the southern shore of Tha-lu Island and then leave the Bay continuing this direction. Relative to fishing gear damage since October 1999, when the project started (demarcated area), it has seemed to decrease, though the effects of the project are not yet clear due to the monsoon and the closed season for Indo-pacific mackerel during the term. It will be more serious after 15 May.

Fisher Group: Ban Kake (Park Prake) Small-scale fishery group
Interview Date: 7 March 2000 (0900-1200 hrs.)
Address: Ban Kake Village, Moo 5, Park Prake Sub-district, Bang Saphan Noi District

General Information:

The village of Ban Kake is located between the Bang Saphan Noi channel and Chai Tha Lay village.

Fisher Group:

The group was established in 1996 and presently has 33 members. Loans at a maximum of Bt.5,000 are available to the members at a 2% monthly interest for a period of 5 months and 3% thereafter. Savings of Bt.50 every Monday are obligatory. All the members are using loans at present.

Fishing Grounds & Fishing Methods:

Around 80% of the fishermen in the village are engaged in anchovy and squid luring light cast netting. This fishing method was started here 6 years ago, it was introduced by fishermen from the east coast. Before that, the majority operated gillnets and traps. Anchovy lure light cast nets are operated throughout most of the year, and squid luring light cast nets for two to three months a year. Fishing boats for cast netting used in this village are 11 to 12 m in OAL and equipped with 100 PS diesel engines and echo sounders. 3 to 4 crew are employed for an anchovy luring cast net and 2 to 3 crew for squid luring cast net. The crews come from the village or outside. The depth of the cast nets is 18 m or more and these are operated in waters of 14 m depth or less. Mesh sizes of the anchovy net is less than 2 mm by interviewer observation, and the squid net is 2.5 cm. Luring lights of 5 to 15 kW are used for both.

Anchovy are divided into two commercial sizes; one is the juvenile called *sai-mai* of around 1.5 cm length, and another is slightly larger around 1.5" (3.8 cm) length. Fishing grounds for *sai-mai* class anchovy are near shore (within 3 km) from the front of the village to Ban Berd, as well as in the northern vicinity of the three Islands. Fishing grounds for 1.5" class anchovy are in slightly further offshore waters, and are distributed from the south of Tha-lu Island up to Ban Berd, where their squid fishing grounds overlap. *Sai-mai* class anchovy cast nets are operated at nights of full moon, and 1.5" class on dark nights. One fishing trip takes a full night. A maximum of 20 operations and twice is the minimum practiced per night (trip). In the case of the *sai-mai* class, six boxes (one box contains 40 to 50 Kg of fish) are caught per night, and in case of 1.5" class, 12 boxes are caught per night.

Product Price & Fish Marketing:

Three middlemen visit the village from the outside to buy dried anchovy. Prices of dried anchovy are Bt.110/kg to 120/kg for the *sai-mai* class and Bt.28/kg to 35/kg for the 1.5" class. 4 Kg of fresh anchovy produce 1 Kg of dried anchovy. Thus, proceeds before deducting costs are approximately Bt.1,000 per box of fresh fish in the case of the *sai-mai* class or Bt.300 per box, in the case of the 1.5" class. The beach price of fresh squid is Bt.40 to 52/kg (10-12 squid/kg, catch volume, which is less than anchovy). Thus, the *sai-mai* luring cast net operation affords the fishermen a quite profitable fishing opportunity. Fishermen said that dried anchovy has an overseas market and their products are exported to Taiwan or Japan. (Fresh Anchovy is Bt.5/kg to make fish meal).

The Attitude of Fishermen toward the Pilot Project:

With regard to the pilot project, the fishermen in this village told us that they understand their anchovy fishing is going to be banned under the project. Other than this, they said that they know little about the project. They were told once by somebody there is a law under which anchovy cast nets with luring lights are already banned within 3 km from the shore of the mainland or Islands, and hence their anchovy fishing is illegal. This information is confusing to them, they said.

The group leader told us that they can not change from the anchovy cast net to other fishing gear. The present income after deducting costs is around Bt.500/day and if it is decreased they can not maintain their livelihood, he said. If in the future under the project the leader emphasized, if a meeting of the nine fisher groups concludes, a ban on anchovy cast net within 3 km of the Islands, they can not agree with it, and that they can accept only the ban within 3 km of the main land. Later on in the interview, the leader changed his comment on their "point of compromise" from "3 km of the land" to "1.5 km of the land".

The fishermen said the *sai-mai* resources have decreased when compared with the past, and that they believe that the resource decline has been caused by larger purse seiners in daytime. Among the fishermen, there is a different understanding of the biology of the *sai-mai*. Some said the *sai-mai* is not the fry of anchovy and is a different species, and lives only around 50 days without growing up. Others, including the leader, understand the *sai-mai* is the fry of anchovy.

Fisher Group: Ban Phang Dang Small-scale fishery group
Interview Date: 7 March 2000 (1330-1600 hrs.)
Address: Phang Dang Village, Moo 4, Sai Thong Sub-district, Bang Saphan Noi District

General Information:

The village of Ban Phang Dang is located between Chai Tha Lay village and Ban Berd village. The front beach directly faces Sang Island, the island nearest to the main land. Near the village, there is a canal that is used as an anchorage for fishing boats, though the canal mouth is narrow and is shallow.

Fisher Group:

The fisher group of this village was established with around 20 members in 1996, and now has 50 members. The amount of the revolving fund is Bt.200,000. The maximum permissible loan is Bt.10,000 at a 2% monthly interest, falling due after five months. Interest income is Bt.4,000 in month, that is to say, the full amount of the fund is lent to the members. Each member must save Bt.50 per month.

Fishing Grounds & Fishing Methods:

The major fishing methods are fish gillnets, swimming crab gillnets and traps. Fish bottom gillnets are operated near the southern shore of Tha-lu Island. The crab gillnets are operated on a wider fishing ground located more to the south of the Island towards the offshore waters of Bang Berd village, where fish traps are also operated but in deeper waters with a rocky bottom. Fishing trips to either of these fishing grounds are made until around a notional line connecting the cape of Mt. Mae Ramphung and the eastern end of Tha-lu Island. In the shallower waters of 2 to 5m depth near the main land shore, traps for grouper fry are operated, where the bottom is rocky and seashells abundant.

Product Price & Fish Marketing:

A fisherman commented on the loans from middlemen. If fishermen lost their fishing gear that had been purchased with a loan, and damaged by commercial fishing boat or

accident, they have to borrow money again from a middleman or their revolving fund. In case of the middleman, as interest is not included, the term for payback would be prolonged. In case of the revolving fund, however, as interest is included, it would mean that the loan is doubled, which would be not possible and they still need to pay back within the limited time.

The Attitude of Fishermen toward the Pilot Project:

In response to our questions related to the pilot project, the fishermen said that they are bored with watching the situation, as the officers still leave illegal fishing as it is, though they know the surveillance is rather difficult due to the shortage of budget. The fishermen feel that the project requires strict enforcement. They believe the fisher groups can cooperate in resource management, although they have to understand that the two villages of Ban Kake and Park Khlong Bang Saphan will have different ways of thinking. Like those of Ao Yang, most of the fishing boats in these two villages use diesel engines and their catch is directed not to the local markets but to overseas markets. In this aspect, these belong to the commercial fishery, so the fishermen in Phang Dang said. It would be difficult, the fishermen added, if the two villages of Ban Kake and Park Khlong Bang Saphan move their fishing grounds from near shore to offshore waters, as their boats are small. In the case of Ao Yang, they can go offshore fishing grounds as their boats are larger, but in case of the two villages, they cannot go so far.

The fishermen said that they cannot accept anchovy luring light cast nets operating near shore and the Islands, as they catch juveniles of both fish and squid. Dried anchovy is exported to Taiwan and Japan, by which anchovy fishing operation is considered to be of a commercial scale. Anchovy cast netting was brought here by fishermen from the east coast and they sold the boats and gear to the local fishermen. Those who bought them have not recovered their investment yet.

The fishermen interviewed said that, 4 years or more ago, anchovy purse seine and cast net could operate about one km from the shore. When these fishing boats were operated, it was difficult for small-scale fishermen to operate their fishing activities in the same waters. In the night time, diving fishery using cyanide shot by water jet gun, are found in the vicinity of the three Islands. They always fish with illegal methods at the night as it is difficult for the officers to find them.

The fishermen said that, at the end of last year, law enforcement against illegal fishing was strict in the Bay. They felt that the resources recovered last year.

In their understanding of the fishing right system, the fishermen said that the resources will be managed by rules regulated by local fishermen, if outsiders want to fish in the Bay, they should respect the rules, the role of the government will be to provide the necessary budget, infrastructures and scientific knowledge, and the role of the fishermen is that, although fishermen always seek more profit, they will respect the rules, as the rules may produce more profit.

To our question on the opinion of forbidden fishing gear in the project area, the fishermen told us that following fishing methods should not be allowed;

- Diving fishery should be limited only to tourism.
- Cyanide fishing should not be allowed as the contamination can be enlarged. Anchovy cast nets will disappear in the future. Enlargement of mesh sizes will not be accepted by the cast net fishermen, as they can not recover their investment if they accept.
- Commercial-scale purse seining and trawling should not be allowed.

The current problems in fishery management in the Bay, were listed as follows by the fishermen;

- The DOF patrol boat sometimes does not operate effectively.
- Trawlers and anchovy cast net boats still operate within 3 km of the shore.
- “Knocking fish” in the vicinity of the Islands.
- In Ban Berd, they have changed the anchovy cast net to other fishing gear like gillnets in the deeper waters. In other villages, this conversion was made, too. The problem of Ban Kake is they keep rejecting the conversion.

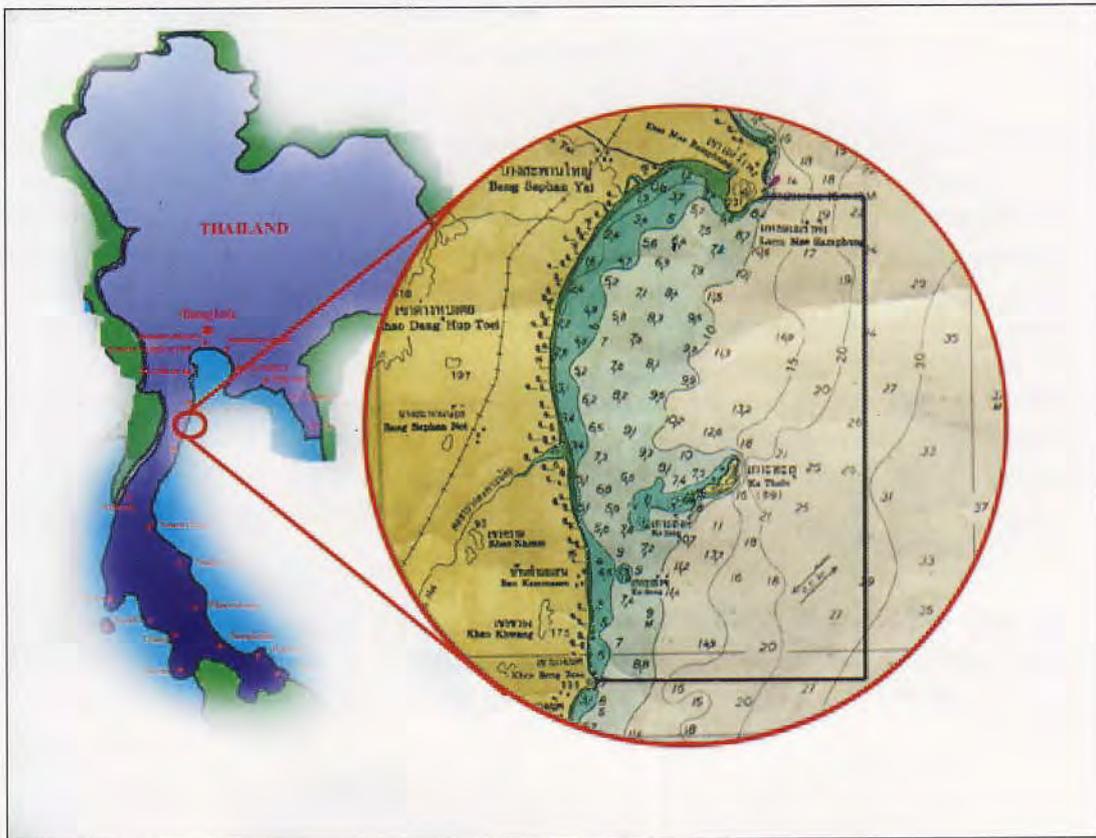
As examples of the signs that the resources are declining, one of the fishermen told us that, though he does not know whether the *sai-mai* harvested with luring light cast net actually live a longer life or not, he knows that it is preyed upon by Spanish mackerel. Since the anchovy cast net started, the Spanish mackerel has disappeared from the northern waters of the Islands. In previous days, their main fishing grounds were the southern waters of the Island and they consumed fuel oil of 5 ltrs./day or less, but nowadays the fishermen have to go to further offshore waters to fish and consume 7 to 8 ltrs./day.

**MAP OF THE PILOT PROJECT AND FISHING GROUND MAPS OF
NINE FISHING VILLAGES**

In the course of our interview for all nine fisher groups, we asked fishermen, mostly core members like group leader, on our question where their fishing grounds are located and which kind of fishing gear is used there. The nine maps attached in the following pages show their answers. These maps suggest us where the nine groups or villages presently find their fishing grounds for targeted species. Mostly the whole waters in front of the project site, from Mt Mae Ramphung to Mt Ban Berd, are used for fishing purpose by these villages. Apart from the fishing grounds near the three islands, however, locations of the fishing grounds used by each of the villages largely depend on location of a village. Fishermen in the site well know where they can find target species. These are main points that we can extract from the answers. These were incorporated in our study on our proposal on the fishing right system in the pilot project.

We need to clarify these maps were produced only for the above purpose and not for other intention that includes fishery resource research or evaluation in the site which may be needed in the future, simply because we did not conduct our survey for that purpose.

Pilot project map

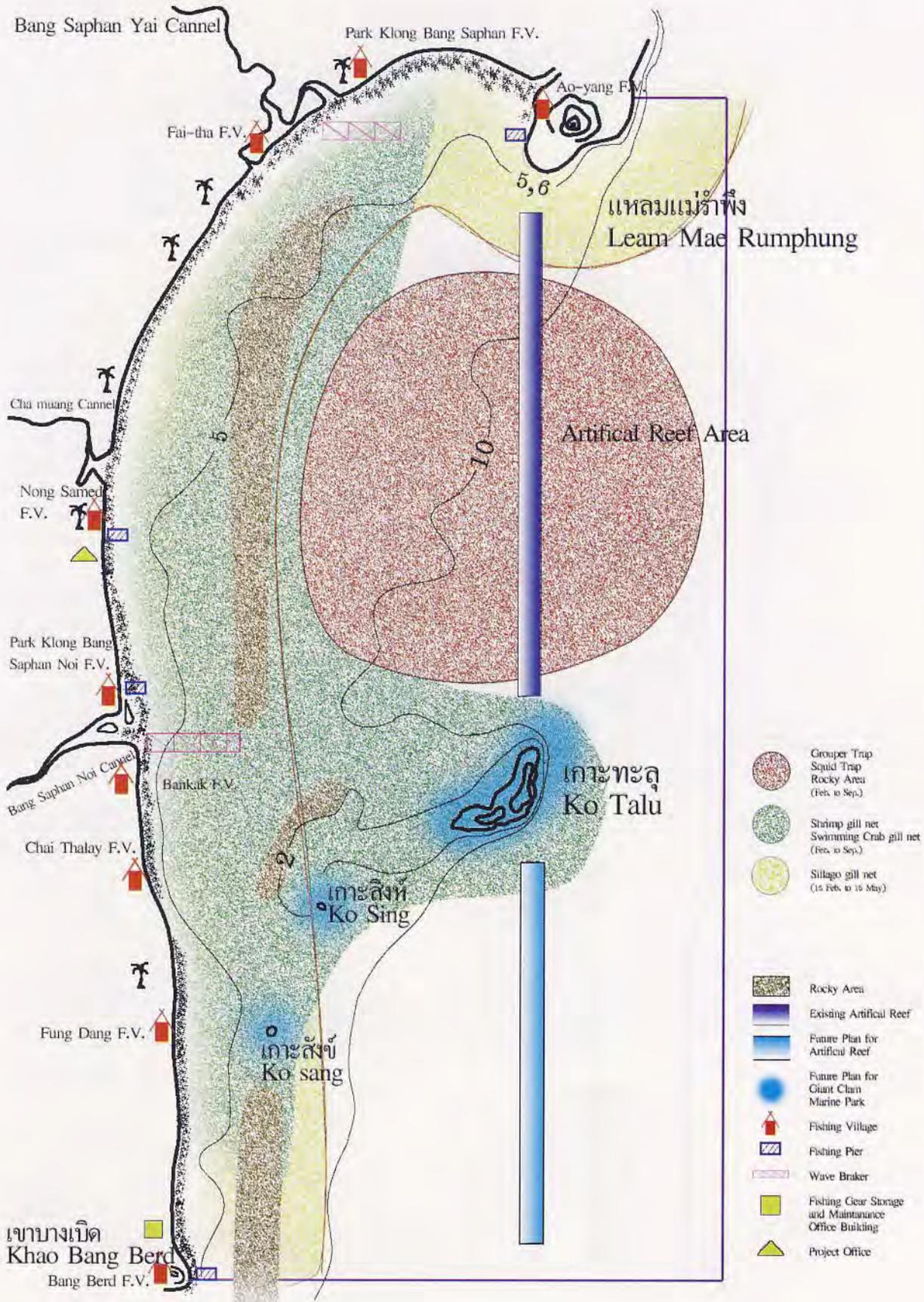


The demarcation area by the provincial ordinance (19 October 1999) is provided with following four points;

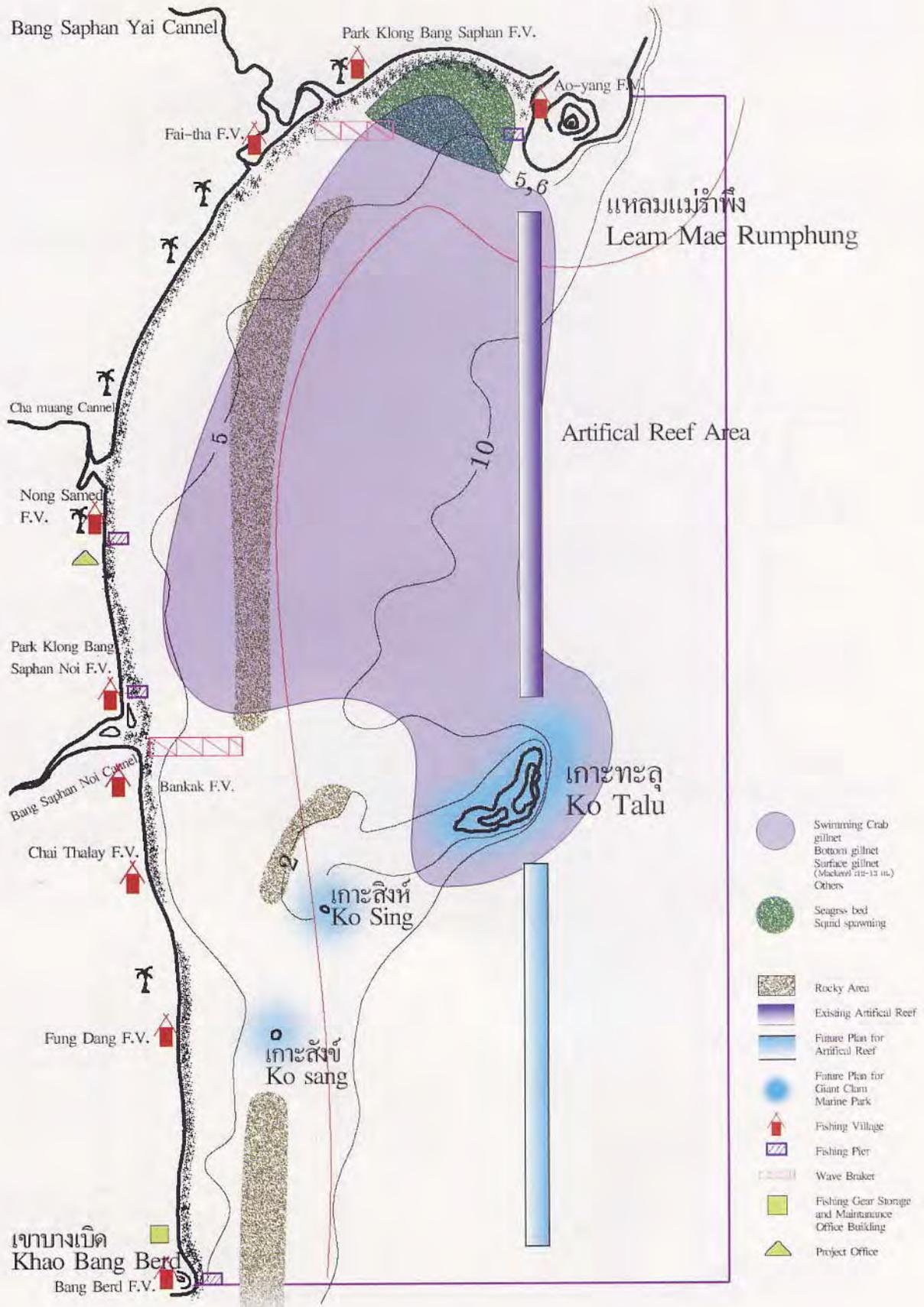
1. Latitude $11^{\circ}11'48''$, Longitude $99^{\circ}34'48''$ (NW point)
2. Latitude $11^{\circ}11'48''$, Longitude $99^{\circ}36'40''$ (NE point)
3. Latitude $10^{\circ}59'30''$, Longitude $99^{\circ}36'40''$ (SE point)
4. Latitude $10^{\circ}59'30''$, Longitude $99^{\circ}30'40''$ (SW point)

Distance is around 6 nautical miles (10.8 km) between the SE and SW point, and is around 13 nautical miles (23.4 km) between the SE and NE point.

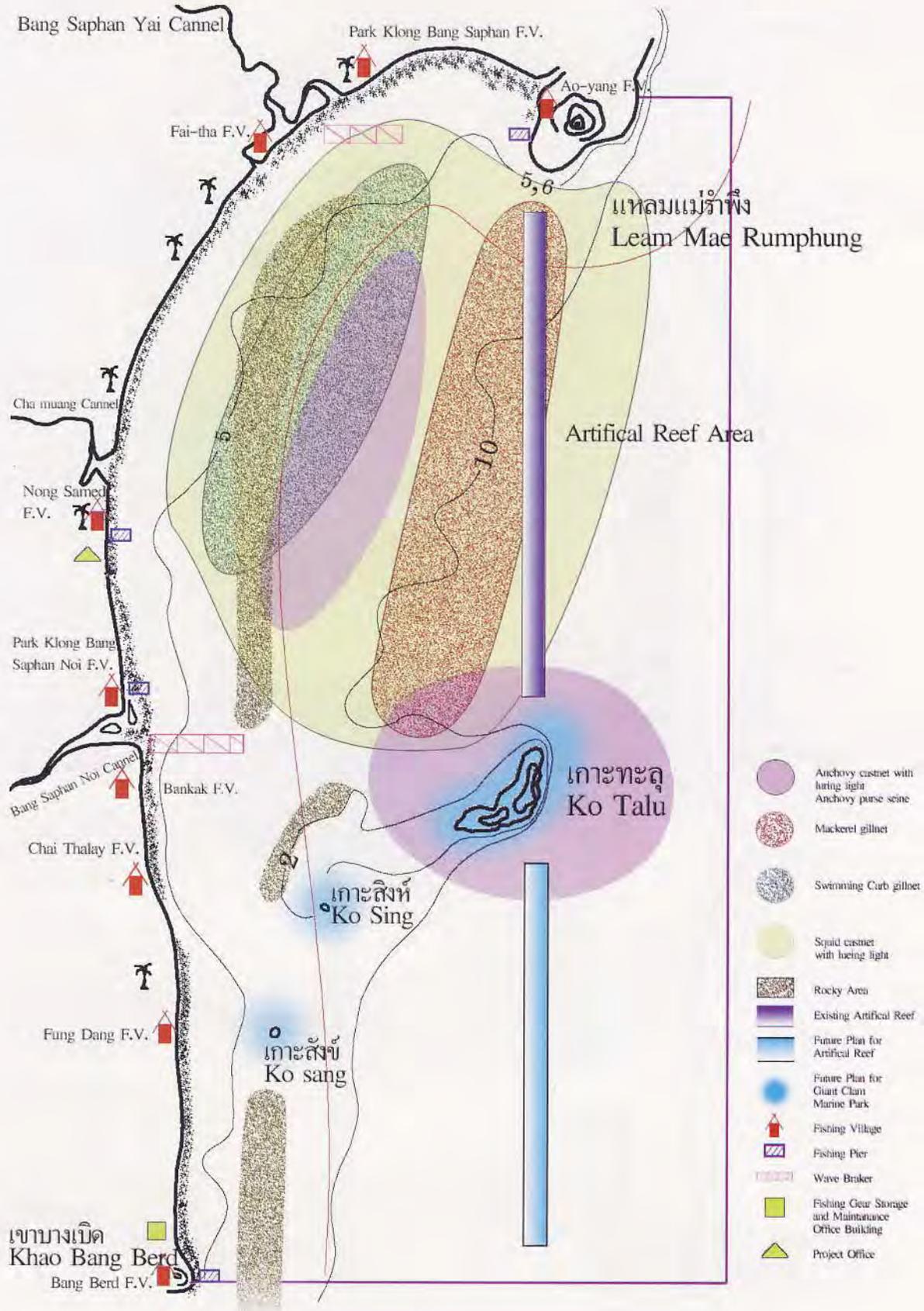
Fishing ground utilized by fishermen of Nong Samed fisher group



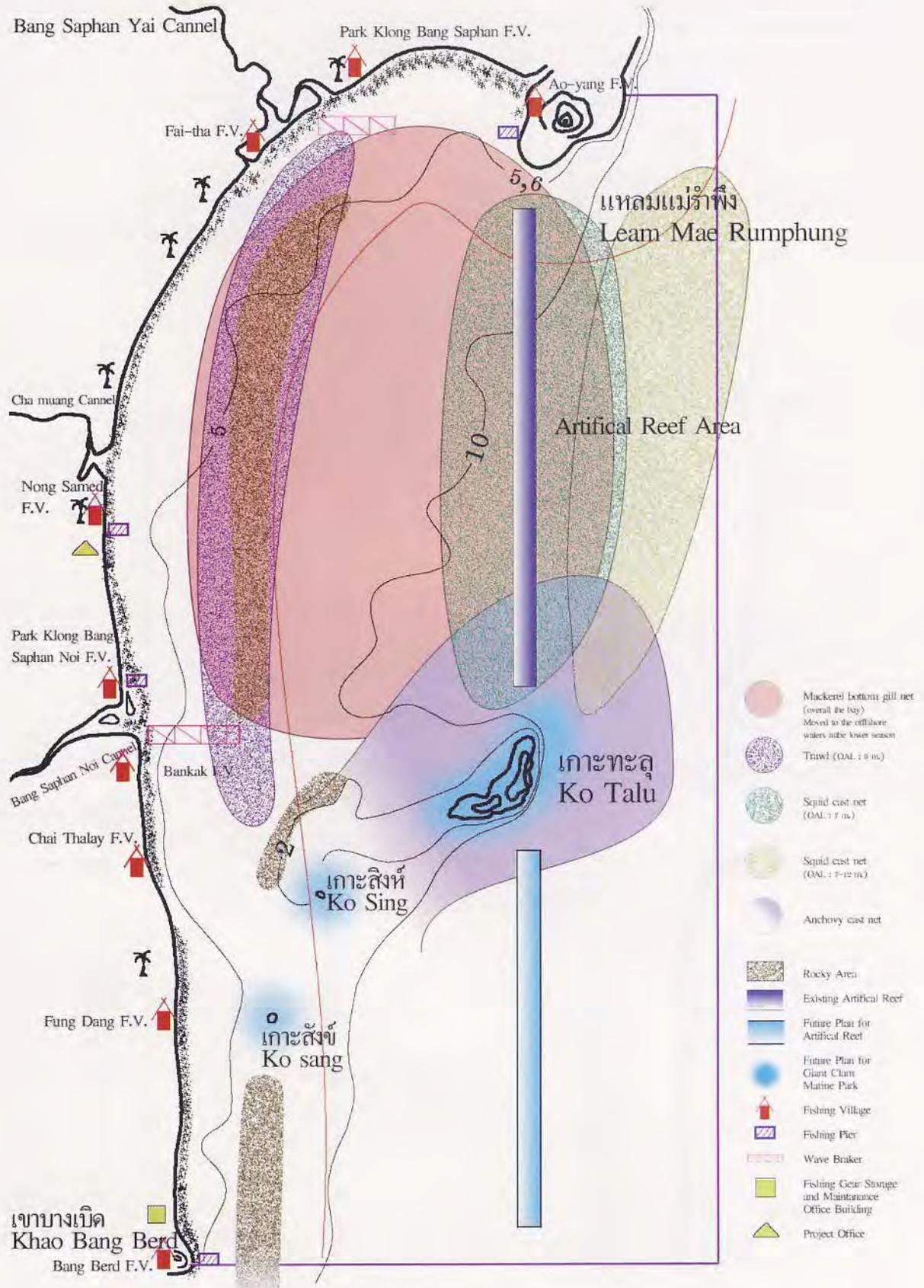
Fishing ground utilized by fishermen of Fai Tha fisher group



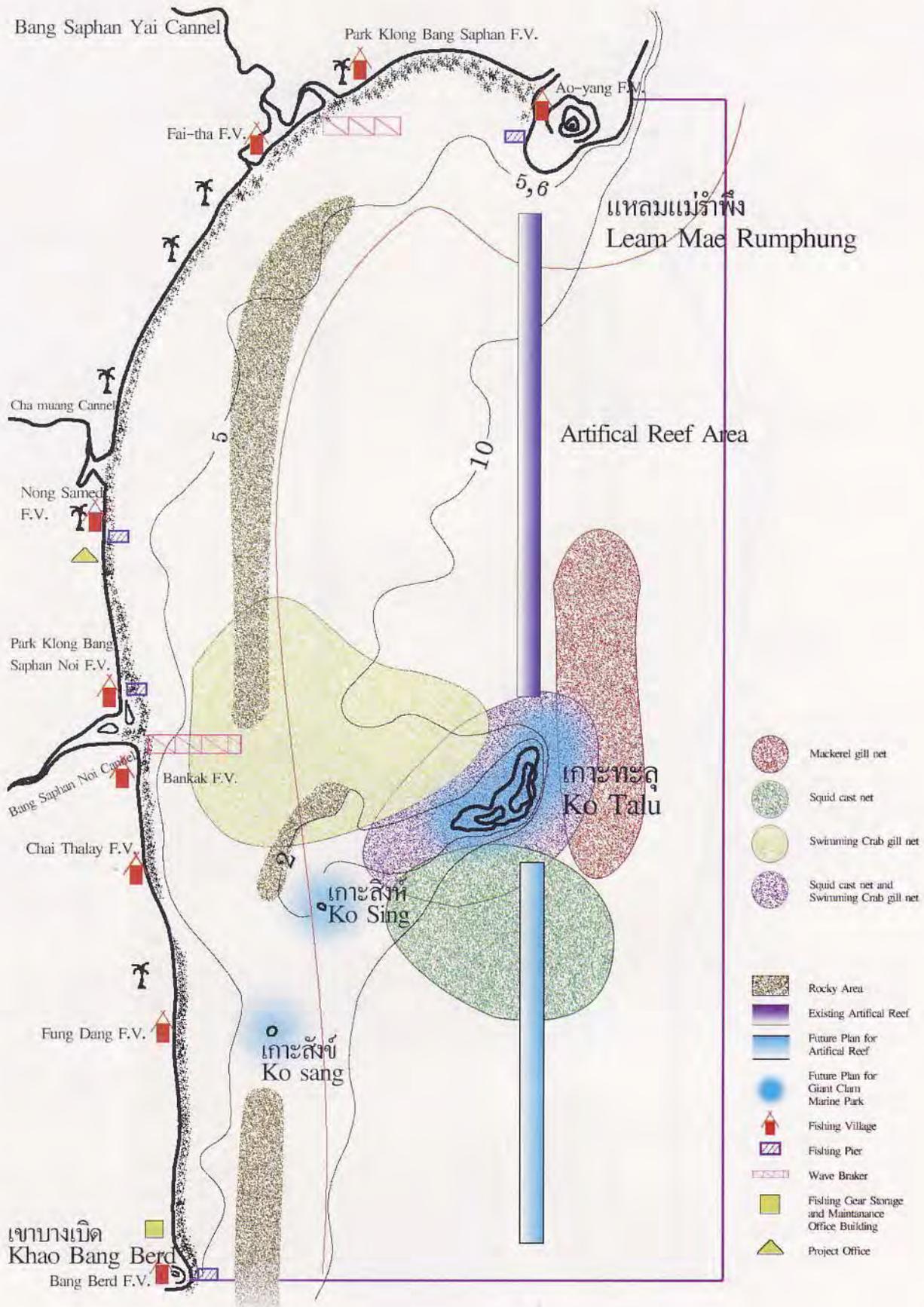
Fishing ground utilized by fishermen of Ao Yang fisher group



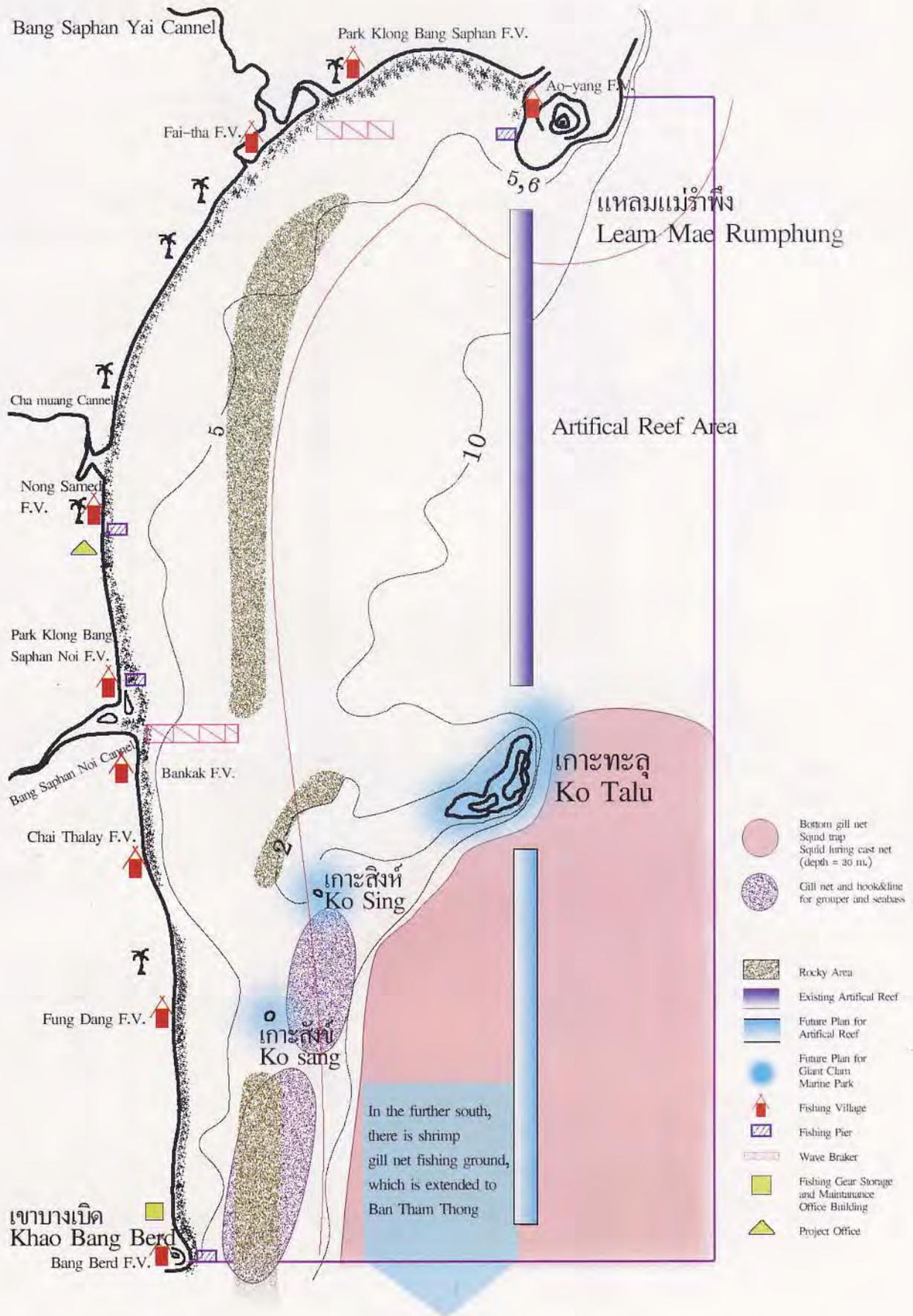
Fishing ground utilized by fishermen of Pak Khlong Bang Saphan fisher group



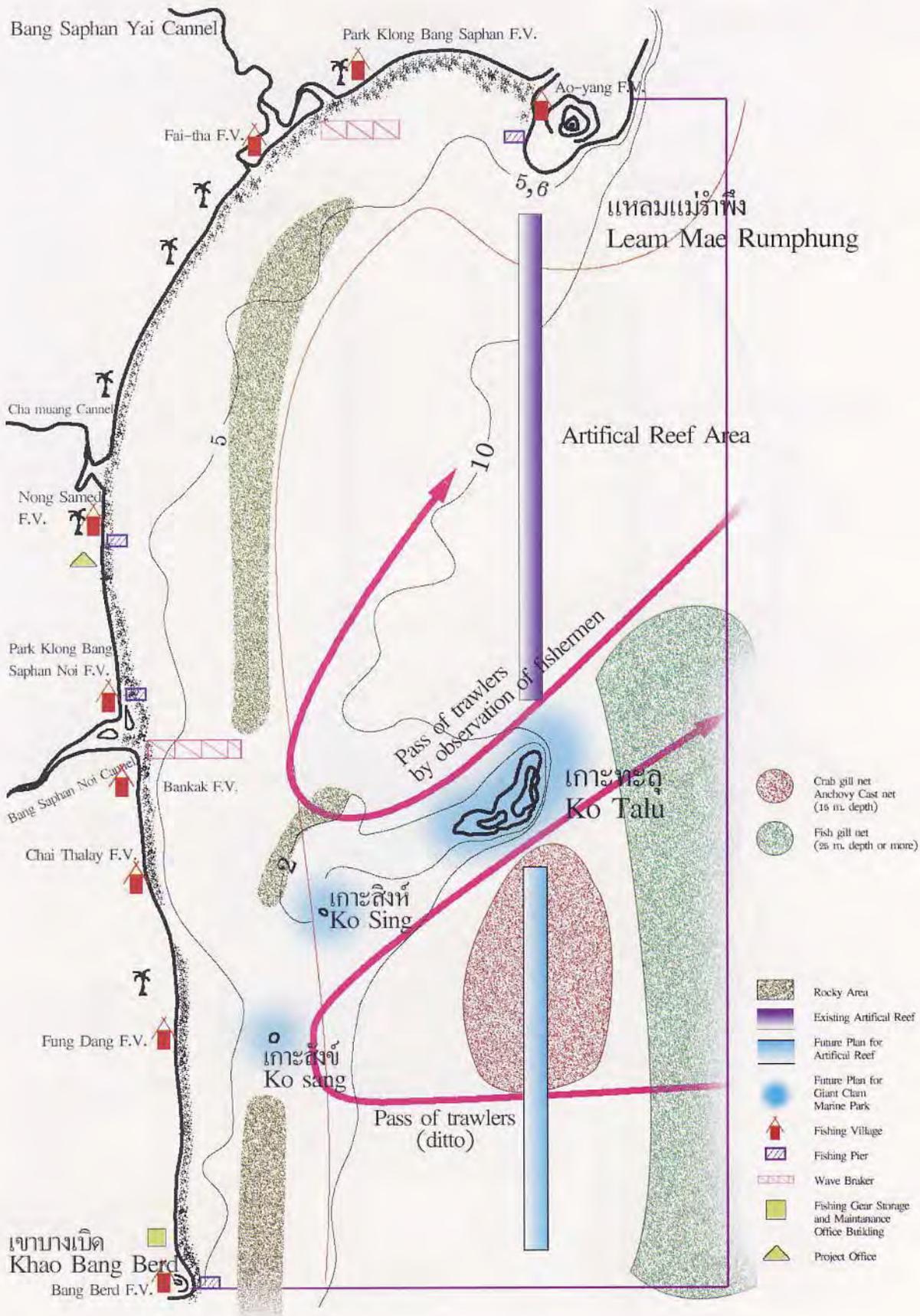
Fishing ground utilized by fishermen of Park Khlong Bang Saphan Noi fisher group



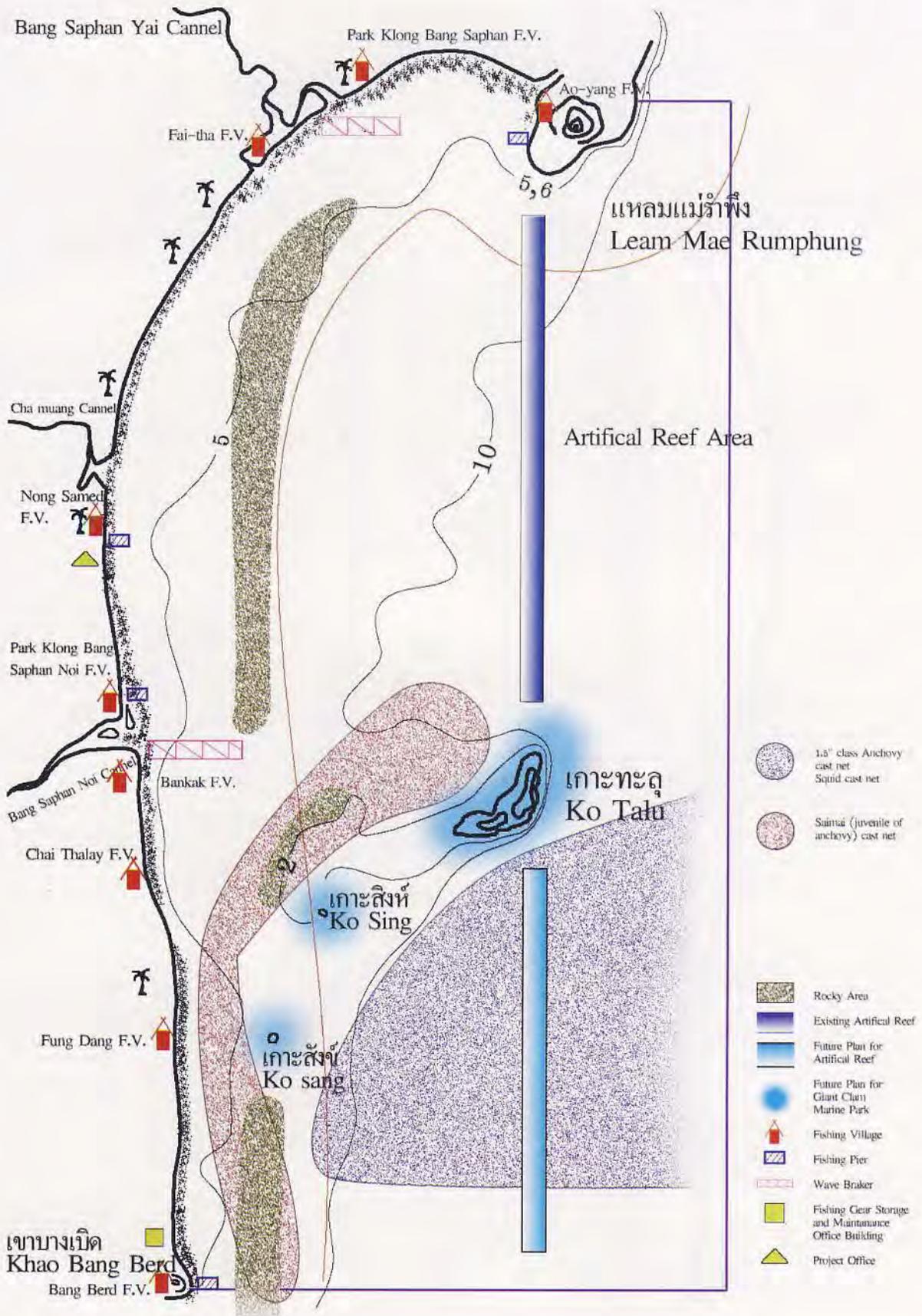
Fishing ground utilized by fishermen of Bang Berd fisher group



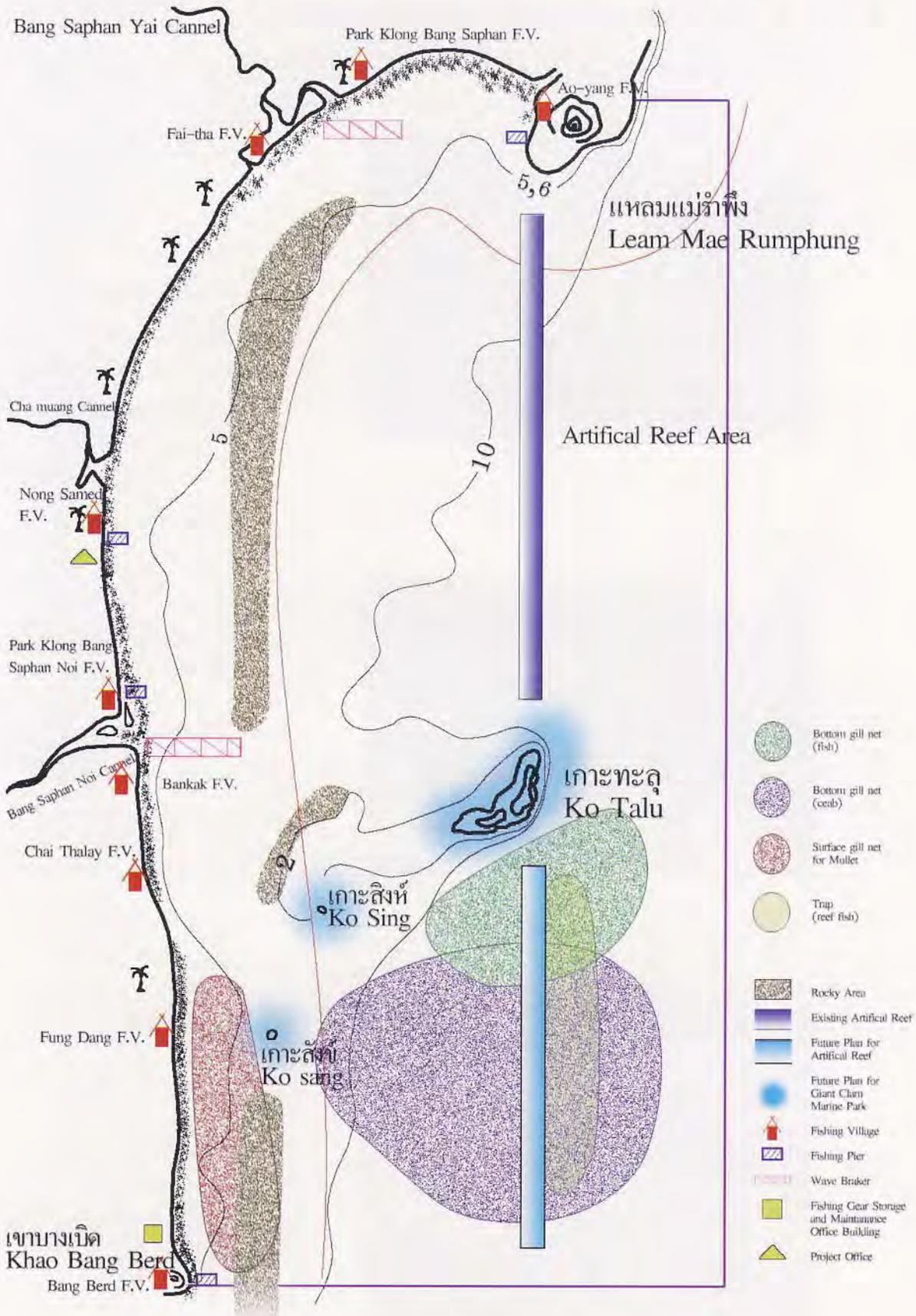
Fishing ground utilized by fishermen of Chai Tha Lay fisher group



Fishing ground utilized by fishermen of Ban Kake fisher group



Fishing ground utilized by fishermen of Phang Dang fisher group



FIELD SURVEY PHOTOGRAPHS



Long tail fishing boats in Phang Dang village, using swimming crab gill net, Indo-Pacific Mackerel gill net fishing traps.



Small-scale fishing boats in Fai Tha village, operating squid luring green light cast net.



Semi-scale Fishing Boats in Park Khlong Bang Saphan Noi village, operating squid and anchovy luring case nets.



Bang Berd fishing village



Anchovy and squid luring
cast net fishing boats
while landing their catch



Patrol speedboat using in
project site



Fishing pier and landing place
for Ao-yang fishing village



Chamuang canal, landing
place for Nong Samed fishing
village



Bang Berd Bay, landing place
for Bang Berd fishing village



Women waiting for squid
that transport from fishing
boat



Weigh before processing



2-4 Baht per kg, depend on
squid size



Sun-dried process giving
higher value for squid, Park
Khlong Bang Saphan village



Packaging according to size of
squid before send to market



Trap for catching small grouper
in Phang Dang village



Remove swimming crab from gill net,
using family labors, Nong Samed
village



Arrange bottom gill net for the next
fishing operation, using women
laborers, Bang Berd village



Middleman shelter for buying fishery
production in Bang Berd village



Interviewing fishermen in Chai Tha Lay village



Dr. Kato explaining about fishing activities in Japan to fishermen of Park Khlong Bang Saphan Noi village

**SURVEY CHECK LIST FOR THE PRELIMINARY STUDY ON THE
FISHING RIGHT PILOT PROJECT
in Bang Saphan Bay, Prachuap Khiri Khan Province, Thailand**

Main Categories	Sub-categories	Descriptions	Intv.	Remark
Social background	Local administration Community map Community local institution Community development activities	Name of sub-district in Bang Saphan Bay, number of Moo of each sub-districts, location of municipal office, kind of public services, taxation and major revenue source	Ext.	
	Population	By Moo and years, No. of Fishing household, Educational level in general	Ext. Statistic Data	
	Major industry	Working population by industry, age and gender	Ext.	
	Social infrastructures at the sites	School, hospital, fresh water, electricity, sewage treatment, home energy	Ext. Leaders Observation	
	Shore based fishery facilities	Anchorage, Jetty, pier, wharf Fish handling space, Cold storage, ice plant, Net loft, stores, fish processing	Ext. Leaders Observation	
	Transport and communication	Transport methods to major cities nearby, saturation level of telephone, TV	Ext. Leaders Observation	
	History of the communities	Villages' oldest episodes handed down, major disasters	Ext. Leaders Observation	
Economic background	Average income of fisher households in the sites	Any estimates if statistics are not available	Statistic Data Fishermen	
	Average income of agriculture households in the sites	(ditto)	Statistic Data Fishermen	
	Price of boat and engine	Fishing boat of typical size, long tail OBM, diesel engine	Fishermen	
	Consumables price	Fuel oil (gasoline and diesel oil), lubricant oil, subsidizing system, daily necessities and foods	Fishermen	
	Engine workshop	Location of engine repair workshop, example of expenses to need overhaul repairs	Fishermen	
	Fishing gear shops	Availability and price of twine, netting, rope, float, sinker, etc.	Fishermen	
	Transport charges	Landing place to markets nearby	Fishermen	

Main Categories	Sub-categories	Descriptions	Intv.	Remarks
Fishing production	Self-own production facilities	Overall length (m) of fishing boat, type and output power of the engine, age of fishing boat, materials of hull	Statistic data Fishermen	
	Target species	List up all the fish species for which fishers operate fishing	Statistic data Fishermen	
	Fishing seasons and grounds	Fisher's positioning methods of fishing grounds. Fishing ground by major species (number of examples of species can be limited within 3 to 4 but should cover at least one representative pelagic and demersal species). Record the location of fishing grounds as many as possible without paying concern on the present fishing right boundary, as well as hours to reach fishing grounds.	Fishermen Ext.	
	Fishing gear and water depth where fishers set it	By major species (ditto)	Statistic data Fishermen	
	Customary rules developed by the community for fishing production	Any traditional, indigenous rules to control fishers and fishing practices	Leaders	
	Estimated catch volumes	By major species (ditto). If fisher interviewed has no record, ask his catch volume in the last week and let him evaluate if it was catch of a high, low or mean level	Statistic data Fishermen	
	Source of workforce	Number of households that use only family members for fishing and landing, and ones that employ workers	Fishermen	
	In case of fishers who employ workers	Kind of fishing, number of employees, Payment system. Does majority of employees come from the community?	Fishermen Ext.	
	Opinion on conserving marine resources	Problems concern, solutions	Fishermen Leaders Ext. Fish traders	
	Other fishery activities	Set net, Aquaculture, Seaweed or shellfish collection, Fish processing, etc.	Fishermen Ext.	
Problems concern		Ext. Leaders Fishermen Fishermen's household		

Main Categories	Sub-categories	Descriptions	Intv.	Remark
Fish marketing	Fish market or fish distribution system in the district	Geographical location of major landing sites, wholesale markets, retail markets in the district and its vicinity. Physical distribution and way of transaction of fish at the following points; at landing sites at wholesale market at retail market	Ext. Leaders Observation Fish traders	
	Fish prices	Price at landing sites and at markets of the major species	Fishermen Ext. Fish traders	
	Middle man (fish agent)	Registration system of wholesalers and fish agents. Number of major fish agents in Bang Saphan Bay. Name of powerful agents and their influence on the fishery communities	Ext. Fishermen Leaders Fish traders	
	Necessity and possibility of joint marketing by fisher groups	Advantage: pricing of fish, stronger fisher group Disadvantage: substitution of financial source of working capital, effort to manage fish transport and marketing	Ext. Fishermen Leaders	
	Problems concern		Fishermen Fish traders Ext. Leaders.	
Economy of fisher household	Major income source of the household	Fishery income, agriculture income, salary, etc. Amount of each income	Fishermen Fishermen's household	
	Major production costs	Fuel oil, personnel expenses, maintenance costs, etc.	Fishermen	
	Opinion of fisher to increase the fishery income	To increase catch volume, to get better fish price, to decrease production costs.	Fishermen Ext.	
	Loan	Dependency on long or short term loans, especially on loan for working capital	Ext. Fishermen Leaders	
	Major assets	(if possible) Land, house, boat, vehicle, etc.	Fishermen	
	Problems concern		Fishermen Ext. Leaders	

Main Categories	Sub-categories	Descriptions	Intv.	Remar
Fishery legal framework	Law enforcement	Surveillance system in the province: patrol and monitoring routines, No. of patrol boat and officer	Ext. Fishermen Leaders	
	Fishing boat registration in the district (Bang Saphan Bay)	Number of registered and unregistered boats Estimated number of fishing boats belonging to small-scale fishery sector	Ext. Fishermen Leaders	
	Fishing boats from the other districts to fish in Bang Saphan Bay	Kind and (estimated) number of the boats, both for legal and illegal operation	Fishermen Ext. Leaders	
	Demarcated waters for resource preservation	Kind of banned fishing gear, effectiveness of the law, number of arrested boats due to use of banned gears since the enactment	Fishermen Ext. Leaders	
Fishery policy framework	Fisher's participation	Present situation and policy for the future	Fishermen Ext. Leaders	
	Authorization for fishery group to manage the fishery resources	- ditto -		
	Concepts of the fishing right in Bang Saphan Bay	Resources reserved under the right (demersal and/or pelagic resources). Management of the right (who and how). Any necessity of rectification of fishing in the demarcated waters by non-community legal boats	Observation Fishermen Leaders	
Fisher groups	Updated information	Number of members of nine fisher groups in the districts, activities, and others	Statistic data Ext. Leaders	
	Organization and activities	Article of association, member qualification, kind of business, account statements	Leaders Fishermen Ext.	
	Resource management	Present activities and group policy to manage the marine resources	Fishermen Ext. Ext.	
Other local institutions	Any local public or private institutions that has influence on the small-scale fishery sector	Women's group, NGOs, religious organizations	Leaders Ext.	
Extension and other administrative services	Activities of extension services in general	No. of extension agents, duty routine, service program	Ext. Leaders	
	Role of extension services in the fishing right project in Bang Saphan Bay		Ext. Leaders	
	Role of other administrative services		Ext. Leaders	

Remark: Interviewee

- | | |
|---|-------------------------------------|
| a. Leader of a fisher group | b. Owner fisher |
| c. Employed fisher | d. Housewife of fisher household |
| e. Fishery administration officer (Extension agent) | f. Municipal administration officer |
| g. Fish trader | |

REFERENCES

Anuchiracheeva, S., (August 1996), **The Development of a Sustainable Fishery in Thailand Through Increased Participation of Artisanal Fishermen**, AERDD, the University of Reading, MSc Dissertation

Anuchiracheeva, S., (November 1999), **The Implementation of Fishing Right Systems in Southeast Asia: A Case Study in Thailand**, submitted to the FISHRIGHTS Conference, Perth, Australia, 14 pp.

Department of Fisheries, (October 1999), **Coastal Fishery Management Project (Fishing Rights)**, Bang Saphan Bay – Bang Saphan and Bang Saphan Noi, Prachuap Khiri Khan, Project Documents prepared by a project team of DOF, DOF

FAO (RAPA), (1994), **Socio-Economic Issues in Coastal Fisheries Management**, Preceedings of the IPFC Symposium 1993, Thailand.

Hirabayashi, H, et al. (November 1980), **Interpretation on Fisheries Cooperative Association Act and Fisheries Law (in Japanese)**, First version, Fisheries Cooperative Management Center Publication Department, pp. 182-184.

Nissapa, A., et al. (August 1999), **Management of Fisheries, Coastal resources and Coastal Environment in Thailand: Institutional, Legal and Policy Perspectives**, ICLARM, pp. i-ii.

SEAFDEC/TD, (1996), **Proceeding of the Regional Workshop on Coastal Fisheries Management based on Southeast Asian Experiences**, Thailand.

SEAFDEC/TD, (1997), **Fishery Resources and State of Stocks Exploitation in the Waters of the Gulf of Thailand, East Coast of Peninsular Malaysia and Andaman Sea**, Thailand.