A REVIEW ON FISHERIES AND COASTAL COMMUNITY-BASED MANAGEMENT REGIME IN THAILAND

by

Ruangrai Tokrisna[1]
Pongpat Boonchuwong[2]
Penporn Janekarnkij[3]

Summit to
International Center for Living Aquatic Resources Management

July 1997

1. INTRODUCTION

[1] Associate Professor, Faculty of Economics, Kasetsart University
[2] Senior Economist, Fisheries Economics Division, Department of Fisheries
[3] Assistant Professor, Faculty of Economics, Kasetsart University

1.1 THE PROBLEM

Due to the tragedy of common and lack of effective enforcement, natural resource management has always been the problem constraining optimization in natural resource utilization. Social welfare in a country rich of natural resources but lack of effective resource management scheme has been degraded via overexploitation of natural resources, both large and small scale operations who have access to resources. Thailand has no exception. Lake of effective monitoring and enforcement worsen the situation. Recently, it has been recognized that community-based resource management regime may be an alternative for a better resource management where there are an inadequacy of information and lack of effective enforcement. Nevertheless successful community-based management relies on various factors. Strong local organization is but one of the criteria for success.

Community-based management in Thailand can be varied, by resource type and by location. Examples are community-based management in mangrove, communal forest, water supply and fisheries. It can be found more often in remote areas where far being reached by government authority. Recently the suffer from degraded natural resources which are sources of rural poor subsistence income and the increasing awareness on their reliance on natural resource produces, local community concern on natural resource management has been increasing. Non-government organization involvement enhances such concerns. Successful development of community-based management needs, at least, strong community organization capable in cooperation on management, recognition on sustainability of available resources, compliance, and effective enforcement. Success and failures are varied among these communities. There should be attempt on studying these management schemes in order to understand the process and to identify the criteria of success.

Community-based management may be an answer to a better management regime for an effective, and perhaps, more sustainable resource utilization. At this stage, there should be a review on the existing community-based management on natural resources in Thailand. The information from such study can provide some guidelines for development of an effective management regime for a better resource utilization. This study attempts to review community-based management and co-management in Thailand with a special reference on coastal and fishery resources.

THE OBJECTIVE OF THE STUDY

1. To identify existing fisheries and coastal community-based management and co-management in Thailand.
2. To review the practice of fisheries and coastal community-based management, as well as co-management in Thailand.
3. To identify the criteria of success for fisheries and coastal community-based and co-management in Thailand.

1.3 SCOPE AND METHODOLOGY

The study puts the emphasis on fisheries and coastal resources while includes, forestry and agriculture community-based management only at relevance to fisheries and coastal resources. Information will be collected via desk review of the existing studies. Historical review on fisheries and coastal resources, the success and failure, will be reviewed to the extent that records are available. It is expected that the review will cover those studies within the past ten years at most.

Highlight will be on successful community-based and co-management where exist. Criteria of success of success will be identified, as well as their impacts on resource sustainability, equity, and efficacy.

Policy recommendation will be drawn from the study results. It is expected that this study will provide useful information for a successful development in community-based and co-management for fisheries resources in Thailand.

1.4 JUSTIFICATION ON COMMUNITY-BASED FISHERIES MANAGEMENT AND/OR CO-MANAGEMENT IN THAILAND

Development in Thai fisheries, especially the rapid increase in number of otter board trawls after the introduction in early 1960s, has led to overexploitation in fisheries resources and conflicts in resource use among the commercial fisheries and the coastal artisanal fisheries.

Demersal catches reduced from 239 kg/hr in 1966 to 105 kg/hr in 1971 , 65 kg/hr in 1978 , and further down to 38 kg/hr in 1988. Potential yield of demersal catches was estimated to be around 154-224 thousand tons annually with a standing stock of 500 thousand tons while the actual catch was over the potential yield since 1978.[1]

Main fishing gears of these demersal fisheries are trawl, push net, and gillnet. The coastal artisanal fishermen usually fish within three km from shore along the coastline of their fishing villages. Most of them use long-tail outboard-motored fishing vessel of less than 10 tongross. Some still use non-motored fishing vessel. Main fishing gears are baby trawl, push net, shrimp drift gillnet, crab gillnet, hook and line, and other stationary gears. Most of their catches are demersal fish and aquatic livings. Commercial fisheries use motored fishing vessel of over 10 tongross. Main fishing gears for commercial fisheries are trawl (otterboard, beam, and pair), purse seine, and other large gillnets. In spite of the prohibition on trawling and motored push net within three km from shoreline, trawling (otterboard and beam) and motored push net are often found fishing within these areas and were believed to be one of the main cause of fisheries overexploitation due to their being highly destructive fishing gears. Conflicts among these artisanal and commercial fisheries are mostly found in cases of commercial trawl and push net fishing within the prohibited zone, among gillnet and trawl including push net, and destructive push net (especially those motored push net).

Limited monitoring and enforcement manpower, equipment and budget for the 2,614 km coastline result in inefficient fisheries management by the central and local government. Despite the existing rules and regulation, artisanal fisheries lost their fishing grounds. Fisheries resources are overexploited and deteriorated. Where alternative avails, artisanal fishermen left fisheries for other more promising occupations. Still, there are isolated fishing villages in lack of development and job alternative. If fisheries is the only reliable sources of income, community-based fisheries management may be the answer for their livings.

Among over 2,500 fishing villages, 80% are located beyond municipality without basic infrastructures including road and electricity. From the Marine Fisheries Census in 1985, 88% of the total 53,313 fishing households are small fishing households with less than 10 tongross fishing vessels. Catches from these small scale

fisheries are only 6% of the total marine catches. Average annual income of these coastal small scale fishing households is less than 2,400 US$/household, 80% from fisheries.

Existing fisheries law was enacted in 1947 and was designed mainly for freshwater fisheries which were the main activities during those days. Regulation on marine fisheries includes closed areas and closed season, gear restriction, and limited entry. While the first two are regulations for renewal resource abundance (which further induce more fishing effort); the last one aimed at effort control, has never been effectively put into effect due to failure in obtaining reliable number fishing vessels.

Constraints on efficient marine fisheries management are limited manpower and budget for the long coastline worsen by inappropriate laws and regulations. Lack of effective management and development without management have led to overfishing and conflict in resource utilization. Recently there have been various attempts in renewing fisheries resource abundance. Examples are the artificial reef program, sea-ranching development program, and stock enhancement. Nevertheless, renewing resource abundance without control on effort can lead to overexploitation once again. Resource limitation and the lack of enforcement cost make way for community-base fisheries management and/or co-management.

1.5 OUTLINE OF THE REPORT

In this first part, the problem of fisheries management and the need of community-based fisheries management and/or co-management have been discussed. Objective and scope of the study have been stated.

In part 2, theoretical concepts on community-based fisheries management (CBFM) and/or co-management (CM) will be given. Included in the second chapter are justification for CBFM and CM, its limitation, economics of CBFM/CM, and key factors for applying this management regime.

Part 3 will look at government role in adopting CBFM/CM in Thailand. Included in this chapter are coastal fisheries management in Thailand, the problems, policies and strategies of Department of Fisheries, the plans for coastal fisheries resource management, management and development program, and the increasing role of community participation in the Eighth National Social and Economic Development Plan. This chapter provide the information on government provision on adopting CBFM/CM.

Part 4 will be the review on the CBFM/CM as found in Thailand. It begins with description on how community-based management has been accepted and adopted in the Eighth National Plan followed by the existing fisheries and coastal community-based management programs, and the case studies of the programs.

Part 5 is the conclusion where criteria of success for fisheries and on CBFM/CM in Thailand is identified.

2. ECONOMIC CONCEPT OF COMMUNITY-BASED MANAGEMENTON COASTAL FISHERIES MANAGEMENT

2.1 JUSTIFICATION

Without an appropriate management scheme, rapid development in fishing industry can lead to problem of overfishing and finally degradation in fishery resources. In open-access fishery, fishermen continue fishing as long as the return from fishing can cover the cost. There is no guarantee that if they do not fish today, they can catch tomorrow. Profit maximization where marginal revenue equals marginal cost does not take place in open-access fishery. Instead, equilibrium will be reached where total cost equals total revenue (i.e. average revenue equals average cost). Resource rent is dissipated as all those returns from fishing are to be paid for costs of fishing which does not take into account the cost the fish themselves. The society as a whole loses what they should gain from such resource exploitation. At the same time fish abundance is degraded. There will be less fish available for future generation.

Among fishery biologists, maximum sustainable yield may be preferred as the volume of catch is maximized while fish abundance is maintained at their maximum growth rate. Fishery economists favor maximum economic yield where the society gets the most from those catches. At maximum economic yield where the return per unit of catch equals its marginal cost, social benefits including resource rent (accrues to the fishing sector) and consumer surplus (accrues to the consumers) are at their optimum.

Various attempts have been carried out in order to manage fishery such that we can optimize exploitation of fishery resources. Often found conventional fishery regulations involve both renewing resource abundance (including closed season, closed area, and gear restriction) and control on fishing effort (including limited license, individual fish quota, and taxation). In Thailand, long coastlines and scattering landing points make difficult effective fisheries management. Their being multi-species and multi-gear fisheries increases the complexity in fisheries management plan. Effective monitoring and enforcement costs are high. Government may not afford such costs. Community-based management and/or co-management coastal fisheries (CBFM/CM) is proposed as an alternative for a better management scheme. Limited government success in effective fisheries management makes way for CBFM/CM in an expectation on improving efficiency, equity, and cost effectiveness of fisheries management. Nevertheless there are certain costs involve in implementing CBFM/CM.

Implementing CBFM/CM can be considered an approach to rectify the problem of common property as fishery resource exploitation can be controlled by fishing community. Property right on fishery resources is defined at a level. Empowering such management scheme increases recognition on resource value and thus a more careful exploitation.

Nevertheless granting right over fishing to the fishing community can lead to underfishing equilibrium where marginal cost equal marginal revenue. The fishermen, with right over fishery resources, want to maximize fishing profit. In such case, fishery resources will not be optimally exploited. Catch will be lower than the optimum level while fish stock abundance will be higher. Consumers have to pay a higher price at this lower landing volume while resource rent, accrues to the fishermen as their fishing

profit, is at maximum[4]. CBFM/CM in fishing village leads to a greater benefit for local fishermen at the cost of present consumers. Nevertheless, the decrease in today catch implies that fish stock can be maintained at a higher level. There will be more resources for the future.

2.2 LIMITATION ON COMMUNITY-BASED FISHERIES MANAGEMENT

Inefficiency in central fisheries management among coastal states in developing countries has led to the development in CBFM/CM. CBFM has been thought of as an effective management scheme due to the success in Japanese coastal fisheries management. Nevertheless there are at least two possible weak points of adopting CBFM/CM which should be considered priory. First, there were certain costs involved. Second, implementing CBFM/CM can take a long time.

In some cases, costs CBFM/CM can be higher than the conventional management scheme. Without an appropriate supporting institutional framework, the success of CBFM/CM can be questionable. Where local institutional framework is weak, additional costs are needed to strengthen and build up community management capacity. Without strong local organization, it can take a long time in developing local capability and participation in fishery resource management. The longer the time the worse the resource condition is. There are costs in implementing CBFM/CM. The benefits are fishery resource abundance. Cost-effectiveness of CBFM/CM should be evaluated in a priori of implementation. Provided the right institutional framework, if local community can benefit from CBFM/CM, it is likely that they will get involve efficiently and effectively.

By characters, high exclusion cost is one of the most important factor limiting chance of success in adopting CBFM/CM. In case of Japanese coastal fisheries, the success can be explained partly by their sedentary species inshore fishery in a confined area. Granting fishing right to fishing community where local fishermen are not capable to exclude outsiders from in their fishing ground can be a failure. The management will be more difficult for those high migratory species. Fishing right over migratory species on the basis of CBFM/CM can be location advantage but cannot be exclusive to fishery resources.

In fishing community where fishermen are heterogeneous in their fishing skill, cost of internal governance can be high. Fishermen with a superior skill earn rent from fishing and incline to oppose any regulation as their rent will be cut unless fishery resources are depleted. Once conservation measure has been agreed, these better off fishermen are the first who can reap benefit from the renewal resource abundance while those marginal fishermen may not be better off. Moreover if introduced in community with varieties of fishing pattern there can be conflict of interest, thus difficult to get an agreement upon management plan.

---

4 If we take the intramarginal rent on inputs (labour and capital), the maximization behavior will be varied among fishing community whom fishing right has been granted, depending on different interest. Those fishing communities who act the owner of fishery resources will attempt to maximize resource rent. Those who act as fishing monopolist will try to maximize producer surplus and resource rent. Those who act as the only fish consumer will maximize consumer surplus and resource rent. (Copes, 1972) In this paper we have not yet taken into account the intramarginal rent on inputs, assuming that fishing inputs are homegeneous.

Equity is another obstruction in implementing CBFM/CM. Granting fishing right to a specific community may not be acceptable, at least politically. Government may be reluctant in advocating CBFM/CM in question of equity and access to fishery resources.

In case of Japan fishing right was granted to coastal fishing community in order to reduce the conflicts among fishermen from different communities where there were strong local tradition and kinship among fishermen in the same community. Government support (especially on demarcated fishing right and large scale set-net fishing right schemes) enhanced the success. Recognition on fisherman social status is another factor of success for CBFM in Japan. The conditions may not be the same in Thailand.

2.3 ECONOMICS OF COMMUNITY-BASED FISHERIES MANAGEMENT

Market failure due to fish being common property and the unsuccessful conventional fishery management by central authority make way for CBFM/CM. We can look at this issue as an attempt to introduce the issue of distribution of control power. Economic is fundamentally distribution of power through market functioning. When control structure works perfectly, market functions. In case of common property fishery resources, market fails. Lack of control induces costly races in fishing and depletion of resources. High costs of monitoring and enforcement constrain effective central management. Control structure has to be corrected. CBFM/CM, granting fishing right thus the control to the community, is recommended as an option.

Institutional environments such as laws and regulations, social norms and customs are given to the community. These are external elements which are out of community's control. If institutional environments are CBFM/CM friendly, success is more likely. Community can make decision on fishery resource utilization and conservation such that control will be exerted until marginal cost of control equals marginal benefit.

In aforementioned, adopting CBFM/CM can be costly if there is a high cost of exclusion. There are "transaction costs" in adopting CBFM/CM. Transaction costs are defined as the costs that arise when community exercises ownership right to resources and enforces their exclusive right. They consist of the cost of arranging an agreement ex ante and monitoring and enforcing ex post. CBFM/CM transaction costs depend on measurability of fishery resources. Recognition and awareness on fishery resource values lowers the transaction cost of CBFM/CM. Another factor determining transaction costs is the nature of transactions. If transactions are voluntary, durable, and simultaneous; CBFM/CM transaction costs can be lowered.

Non-exclusivity and high governance costs[5] discourages willingness of those local fishermen to participate in CBFM/CM scheme. Improving quality of fishery resources will be difficult without active participation among fishermen. Transaction costs are high in such case.

---

5 "Governance costs depend on the structure of the contracts used to constrain the actors, the system of enforcement, and informal institution " Eggertsson (1993)

Maximizing the net benefit from CBFM/CM involves both maximizing resource rent from sustainable stock as well as minimizing transaction costs of the controlled fisheries. Whether it is worthwhile to adapt CBFM/CM depends on costs and returns from fishing and transaction costs of which exclusivity and governance play a key role. CBFM can be a solution if the net benefit from this management scheme can be maximized.

It is likely that providing an appropriate external environment, where prevention on encroachment by the outsiders is possible and governance costs are relative low, it is likely that CBFM/CM is recommendable.

Exclusivity and governance costs depend on several factors including natural barries to entry by the outsiders, physical characters of fishery resources (being sedentary or migratory), fishing pattern (multi-species, multi-gear, seasonal, fishing gear conflict, inshore or offshore), state of technology (traditional or modern), political support (in favor of uplifting the coastal fisherman livelihood or equity of access to fishing,), laws and regulations, social organization (strong or weak local group: interest, willingness and capacity of the local fishermen in participation on CBFM/CM scheme), norms and customs, and relative prices and value judgment on fishery resources. These factors should be considered before the attempt on adopting CBFM/CM.

Investigation on economics of CBFM/CM, examining on the organization of the control structure including various contractual arrangements and economic activities and economic results (success and failures and development of coastal fisheries), provides a basic guideline in adopting a successful CBFM/CM.

2.4 KEY FACTOR FOR COMMUNITY-BASED FISHERIES MANAGEMENT

CBFM/CM can work effectively in coastal fisheries where fishery resources, being mainstay of coastal community, are being depleted. Being the only source of source of income, local fishermen recognize value of fishery resources and willing to participate in renewal and sustained their resource abundance. Fishing boundary should be identifiable such that problem of exclusivity can be minimized. Fishermen should be equipped which capacity of effective management at the initial.

Once CBFM/CM is selected, community participation should be strengthen and built up to adopt their management plan. Government agencies should provide supports on community empowerment (including supporting framework, laws and regulations, finance, and education). Local fishermen are stakeholder and must effectively involve in decision making. Management plan should be decided by the local fishermen and worked from bottom-up not top-down. Actions and changes take place must be agreeable at community level. Effective involvement of local fishermen can be increased if the benefits to be received from CBFM/CM can be visible, quick and proportionate to their contributions.

Key factors for successful development of CBFM/CM are as follows[6].

[6] These are the key features for successful community-based development as recommended by Narayan (1995).

1. Encouraging participation of local fishermen via participatory among relevant agencies in preparation for CBFM/CM, consultation, pilot activities, and structured learning.
2. Emphasis on the collaboration at the community level via recognition on the need and interest of the local, assurance of net benefits to the local from their involvement in CBFM/CM, embedding social strong and active local organization, building up community capacity (including leadership, knowledge and skill for effective fishery resource management), support on community's regulations and enforcement.
3. Adoption of appropriate technology that suits community needs
4. Effective outreach program with two different approaches, empowerment and extension. Empowerment approach is essential. While extension (fishing as well as others), empowerment approach focuses on effective involvement of the locals.

In adoption of CBFM/CM, following checkpoints should be considered[7].

1. Benefits and beneficiaries from CBFM/CM.
2. Needs and capacity of the community.
3. Needed changes, in physical and capacity, at the community level.
4. Key persons and community level and their roles.
5. Roles of supportive agencies, both government and non-government
6. Appropriate outreach program, empowerment and extension.
7. Investment on building up community capacity in effective management.

Provided the right community capacity, CBFM/CM can be an answer to an effective fisheries management in tropical multi-gear multi-species fisheries. Nevertheless there are certain costs involved in adoption of CBFM/CM. CBFM/CM should be selective and may not be applicable on a large-scale basis. Careful design for certain success at the initial stage of development can induce more success from this management scheme.

3. GOVERNMENT ROLE IN ADOPTING CBFM/CM IN THAILAND

3.1 THE BACKGROUND

In Thailand, there are 24 coastal provinces and according to the Fisheries Statistic Record, the fishing ground is dividing into 5 zones: Zone 1, eastern Gulf; Zone 2, inner Gulf; Zone 3, upper southern Gulf; Zone 3, upper southern Gulf; Zone 4, lower southern Gulf and Zone 5, the Andaman Sea. It was illustrated in the Marine Fisheries Census, 1995, of the number of full time fishing households 53,313 units and fishing worker household 28,934 units which increased from the last ten years 3.1% and 6.8% respectively with the majority engaged in marine capture fisheries which can be divided into large scale fisheries and small scale fisheries (table 1). Large scale fisheries are employed with powerful fishing gears such as trawlers and purse seines while small scale fisheries who fish on subsistence basis are employed with small traditional fishing gears such as trammel net, crab gill net, fish gill net and etc. The full time small scale

7 See details in Narayan (1995).

fishing household was about 87% of the total fishing household which produced about 13% of the production of the country. The total population who are engaged or related to the fisheries sectors are about 320,000 which can be classified as large scale fishermen 70,000; small scale fisherfolks 180,000 and fisheries related 70,000.

The total number of fishing boats was 54,751 which can be divided into outboard (longtail) engine 36,634; inboard engine 14,956 and non motorized 3,116 (Table 1). It was recorded that 1,288 fishing boats or about 2.4% increase from from the last ten years (1985).

Table 1. Numbers of marine fishing household and fishing boats of Thailand, 1995.

Items	Total	Fishing Zone				
		1	2	3	4	5
Type of household:						
Full time household	53,313	6,280	5,923	7,312	16,935	16,863
Worker household	28,934	2,570	3,360	4,424	11,272	7,308
Type of fishing boat:	54,715	6,431	6,633	7,568	16,846	17,237
Outboard engine boat	36,634	3,261	2,362	4,696	12,869	13,446
With engine boat	14,965	2,903	4,046	2,718	2,751	2,547
Without engine boat	3,116	267	225	154	1,226	1,244

Source: The 1995 Marine Fisheries Census, National Statistics Office, Thailand

Note: Zone 1; Trad, Chataburi, and Rayong
Zone 2; Chonburi, Chachaengsao, Samut Prakan, Samut Sakorn,Samut Songkram, and Phetchaburi
Zone 3; Prachaun Kiri Khan, Chumporn, and Surat Thani
Zone 4; Nakorn Sri Thammarat, Pattalung, Songkla, Pattani, and Narativat
Zone 5; Ranong, Phang Nga, Phuket, Krabi, Trang and Satun

The marine fishing industry of Thailand buoyed by success in otterboard trawling which were rapidly developed and expanded in the late 1960's to early 1970's and further developed onwards. The trawl are the most productive sector of marine fisheries in which yielded over 58% of the total marine catch of the year 1993. The number of registered trawlers of Thailand has increased drastically from 99 in units to 2,026 units in 1963 and there after has continuously increased to 9,465 units in 1992 with a maximum record of 13,113 units in 1989. The rest percentage is shared by the pelagic fisheries which is dominated by purse seines, gill nets and small scale fisheries. Fish meal plants that used trash fish to produce fish meal were drastically increased from 79 units in 1978 to 91-98 units during the year 1979 to 1991 and highly increased in 1990 And 1992 which were 104 and 106 units respectively.

Attempts have been made by scientists both inside and outside Thailand to assess the potentials of demersal, pelagic and invertebrate fisheries resources in the Gulf of Thailand and Andaman Sea. The estimated potential yields of various fish stock derived from the relationship between catch and effort and from assessment of the single species bases were made. It is clearly that the demersal fish stocks in Thai water have been overexploited. Catch composition is changing towards small and less

valuable species. The rapid development of the commercial trawling and purse seining fleet has resulted in extreme economic hardships for small scale fisherfolks who can no longer compete for limited resources. Furthermore, trawlers, purse seiners, push netters and clam dredgers damage marine resources through their used of small mesh cod-end and sieve sizes, which retain juvenile fish, shrimp, swimming crab and clam thus decreasing recruitment of high valuable and marketable size species into the fisheries.

Thai people who resided along the coastal areas have not earned their living only by capture fisheries but also conducted aquaculture of shrimp, fish, oyster, mussel, crab and etc. The increasing of shrimp culture areas in remarkable since the last decade, the culture areas have been increased 93.9% and shrimp culture household has increased 4.5 times. The total areas for shrimp culture are 420,724 Rai whereas the areas for fish culture, mussels and oysters culture, and crab culture are 4,821,15,605 and 6,329 Rai respectively.

These remarkable developments by increasing in intensity, the accelerated mechanization of fishing craft and land development for aquaculture in the absence of appropriate management measure have resulted in the decline of resource abundance and degradation of environment, particularly in the coastal areas. The drastic reduction of catch rates and the occurrence of over fishing of demersal resources have been clear observed. As regards pelagic resources, it is recognized that many economically important species have been fully exploited and some species may be subjected to over exploitation. The continuing decline in catch rate, the almost disappearance of certain predominant or target species, the observes changes in species composition in the catch, and the predominance of trash fish with comprising small economic species caught are very common phenomenon at the present.

The Department of Fisheries of Thailand recognized that the expansion of marine capture fisheries into the high sea fisheries has to be initiated, although the potential for utilizing the high sea resources is not yet being well examined. DOF also gives greater emphasis on increasing mariculture production per unit are.

Minimization of fish wastage juvenile food fish and other post harvest losses and/or to introduce better technologies in finding the ways and means for alternative utilization of fish discards and trash fish for human consumption or for other use have been developed. Rehabilitation of fishing ground and minimization of conflicts between small scale and large scale fishermen have also been performed. Thailand is also willing to share its fishery expertise with neighboring countries both within and outside ASEAN region through joint venture and capital investment.

3.2 PROBLEMS TO BE ADDRESSED

Due to the rapid expansion of the Thai marine fisheries in the past, it has effected the great pressure on the available resources. The result of intensive exploitation of resources, without systematic management and rehabilitation, leading to greater conflict in their uses. The marine fisheries resources which contributes to national economy, has now become constraints for future development. It is clear that over all stock size of demersal and some group of pelagic resources are rapidly losing their characteristics and are less abundance. The catch composition keep changing toward smaller and less valuable species. It is estimated that over 50% of the total landing are trash fish, and more than 30% if trash fish are juveniles of foods fish

species. Similarly, coral reef resources have also been damaged due to natural and economic factors, particularly fisheries and tourism.

To conserve the marine fisheries resources, DOF has set up various management measures through the Fisheries Act of 1901 and was consequently revised in 1947 and 1982. The objectives of these regulations aim to determine the size and kinds of fishing implementations that are permitted in fisheries; prohibiting the use of certain types of fishing methodology in certain areas; establishing spawning and nursing seasons and areas of marine resources and prohibiting the use of certain types of fishing gear during the said season and areas; mesh size regulation for purse seining, gill netting and squid lift netting; limiting the new entry of trawl fisheries and ceasing to grant new trawl licenses. However, those regulations have not been fully enforced, and some fishing operation still operate illegally evading the regulation.

Recently, DOF has established a project on artificial reef installation with the purpose to provide habitats for marine resources and their juveniles allowing more resources to reach marketable size and reproductive size, and it will form physical obstacles to nearshore trawling and push netting. Conservation areas are also being established.

The depletion of fisheries resources and degradation of coastal habitats due to the destructive fishing operations cause the effect through all living resources. In addition in some coastal area, increasing land base development polluted coastal waters. The major pollutants affection coastal habitats are sedimentation, increased nutrient input from domestic discharge and industrial and mining runoff.

The law enforcement effort for prohibited fishing and illegal fishing methods is required. As various types of fishing gears increase, conflicts among users due to their interference with each other for competing the same resources are occurred. Small scale fishing gears are usually damaged by trawlers and mechanized push nets, thus the conflicts among these groups of fishermen have to be taken into consideration of the government and as recognizing that small scale fishermen are the majority of fishermen society in Thailand, the poverty and disadvantages of this population is also to be solved.

3.3 FISHERIES LEGISLATION INVOLVING FISHERIES RESOURCES MANAGEMENT

In managing marine fisheries resources of Thailand, there are generally two types of fisheries legislations involved. First, the relevant issues consist of the Act Governing the Rights to Fish in Thai Waters and the Thai Vessel Act. Second, the Fisheries Act is directly concerned with the conservation of fisheries resources in both fresh water and marine fisheries.

3.3.1 The Relevant Issues

1).The Act Governing the Rights to Fish in the Thai Waters

Thailand has long distance of coastal lines, approximately 2615 kms. The coastal lines are bounded by the Andaman Sea and the Gulf of Thailand. These areas are rich of natural resources, especially the fisheries resources. Realizing that those natural resources belong to the national wealth, the Thai government issued the legislation on the Act Governing the Rights to Fish in Thai Waters in B.E. 2482 (1939).

Under the Act, the Thai fishing waters are defined as the Thai territorial waters, proclaimed of 12 miles off-shore limit. However after the proclamation of Exclusive Economics Zone (EEZ) in B.E. 2524 (1981), the territorial waters was extended to the limit of 200 miles. According to the Act, all fisheries resources in the Thai territorial waters belong to the nation. The country has the right over those fisheries resources. Only Thai nationals are allowed for fishing right. Other aliens or partnerships whose all partners are not Thai nationals or companies whose all share-holders are not Thai national are not eligible for obtaining the fishing right. The fishing right can be issued to the limited partnership whose all Thai partners are unlimited liabilities and at least 70% of the capital is owned by the Thai national partners. In case of the limited company, it can be issued when the majority of committees are Thai national and at least 70% of the capital is owned by the Thai. Furthermore, those partnerships or the companies need to be registered and have its head office located in Thailand.

The Act also prohibits foreign vessels or alien vessels or Thai vessels whose crews included aliens to operate fishing in the Thai waters, except where the agreements to the contrary have been set with those countries.

2) The Thai Vessel Act

The Thai vessel Act was established in B.E. 2481 (1938). Under the Act, the owner of a fishing vessel with engine or a fishing vessel of 6 GT and over is required to register their rights with The Harbor Department, Ministry of Communication. The qualified boat owners is that he or she must be an individual with Thai national or a partnership or a company whose all the partners or share holders are Thai national. If it is a limited partnership, at least 70% of the capital must be owned by the Thai partners with unlimited liabilities. For the case of a limited company, it must have the majority of its share holders to be Thai nationals and at least 70% of its capital needs to be owned by the Thai.

Because fishing boat license is issued by the Harbor Department and the law does not require non-mechanically propelling boats of less than 6 GT to be registered. The fishing boats statistics is underestimated. Lack of enforcing authority of fishery officers causes problem in controlling and managing a fishing boat license.

3.3.2 The Thai Fisheries Act

In the past, before the Fisheries Act was formed in B.E. 2490 (1947), the Thai fisheries resources were managed and conserved under the Water-Duty Act of R.E. 120.[8] In the Act, the fishing area was defined as a sanctuary and a reservation. Fishing in area close to monasteries or places for worship, and in sanctuary area was prohibited. In flooding time, the law also prohibited fishing during a spawning season. Furthermore, fish poisoning was definitely prohibited.

Eventhough the Water-Duty Act was revised in B.E. 2472 (1929), B. E. 2477 (1934), B.E. 2479 (1936), and B. E. 2481 (1938), it could not alleviate the deterioration of fisheries resources as a result of the recent development in fishing industry. As a consequence, the Fisheries Act of B. E. 2490 (1947) had been drawn up. The present

[8] *R. E. moons Ratanagosin Era which is equivalent to B. E. 2405 or 1962*

of this Act promptly caused the abolishtion of the Water-Duty Act. In the Fisheries Act, the "aquatic animals" are defined as all aquatic flora and faura. Moreover, the fishing area is divided into 4 types [9] a sanctuary area, a leasable area, a reserved area, and a public area.

The sanctuary area included areas nearby or in monasteries or places of worship, in navigation locks, weirs, and dams, or in a place suitable for preservation of aquatic animal preservation. Fishing aquatic animals in such areas are prohibited, except receiving a permission from the Fisheries Director General.

The leasable area is the fishing area where an individual can lease by bidding. Only the assigned bidder has the right to perform fishing in such area. The exception is made for those who fish for household consumption by using an approved fishing gear.

The reserved area is the area arranged for individual fishing license. Fishing in this area is subject to compliance with conditions imposed by the Director General of Fishery Department or competent officials.

The public area is an open access fishing ground which is free for anyone to fish. However, they need to conform with the conditions proclaimed by the Director General.

The law empowers the Minister of Agriculture and Cooperative in issuing notices concerning with the subjects specified in the articles.[10] Generally, the Minister authorized these following matters :

a). to require anyone who has fishing occupation to register with the Department of Fisheries,

b). to require owners or occupants of fishing gears to register the fishing gears with competent officials,

c). to withdraw fishing licenses or any leasing licenses [11]

d). to exempt fishing gear licenses in a specified location,

e). to determine types, numbers, and sizes of fishing gears and their equipment,

f). to prohibit the use of fishing gears in fishing areas; to determine a location and distance of stationary gears,

g). to determine the spawning season, the fishing area, the fishing gears and method uses,

h). to determine the types, the sizes, and the numbers of fish which allows to catch and to prohibit any species of fish from being fished.

---

[9] *Fishing area is offend as seas, river, cannals, swamps, ponds, reservoirs with water or water running, beaches, public resources including forests and land areas with flooded season.*

[10] *It has 73 articles and 4 sections in the Fisheries Act.*

[11] *In practice, the provincial governor with the approval of the Minister can issue a withdrawal of fishing licenses or fishing permissions.*

Generally, three different types of licenses are issued to fishermen : a fishing license, a fishing gear license and a leasing area license. The owner of these licenses is subject to pay duty fees. Their rate are specified in the Fisheries Act

The license transfer is allowed by an endorsement of competent officials. The endorsement fee is collected on registration. For a person who offends the Act or the conditions specified in the licenses, the competent officials can authorize the withdrawal of these licenses. Normally, the period of licenses is valid only for one year. A renewal can be made during April 1, to March 31, of the following year.

The Act also issues penalties for any offense. The penalties are different depending on offending activities. The degrees of penalty are increased when the offending activities are related either to fishing in the sanctuary or the reserved areas or the violate the Minister's proclamation on the regulatory schemes.

Since B. E. 2490 (1947), the Fisheries Act was revised twice. The first revision was done in B. E. 2496 (1953). Its major revised issues were (a) to prohibit encroachment on fishing ground by any construction (b) to prohibit the use of fishing grounds for planting lotus, rice, kenaf, and other aquatic plants,[12] (c) to prohibit anyone to occupy any aquatic animal or egg of any aquatic animal specified in the Decree Ordinance.

The second revision was done in B. E. 2528 (1985). Its main purposes were : (a) to increase degrees of penalty to the offenses, (b) to empower the authority in enforcing the fishing boat owners to be responsible for any damage or expense that would occur from the vessel violation in foreign fishing waters, and (c) to strengthen the definition of "aquatic animals" in the previous Act.

Although the Fisheries Act provides law to manage the fisheries resources, the law is valid in practice when the Minister issues the notice in concerning the conservation and management activities.

3.4 EXISTING DOF PROGRAMS FOR COASTAL FISHERIES . MANAGEMENT AND DEVELOPMENT

3.4.1 Fisheries Management Program

Under the Thai Fisheries Act, many fishery management measures have been implemented for recovering the fisheries resources. The main measures are as follows :

3.4.1.1 Area and Seasonal Closures

This measure is mainly aimed to recovering of the Indo-Pacific mackerel (*Rastrelliger brachysome* Bleeker) which is an important economic species of Thailand. In the early 1980s the total catch of this species showed a declining trend. Therefore, to renew the resource abundance of this species and other pelagic fish as well as the demersal stock, various regulations on area and seasonal closures have been

[12] *Its purpose was to protect fresh water fishing ground*

practised from 1984. From 1 February to 31 March and 1 April to 15 May, the trawlers and pure seiners with mesh size smaller than 4.7 cm have been prohibited from fishing in the upper southern area of the Gulf of Thailand.

3.4.1.2 Gear Restriction

In order to preserve the coastal fisheries resources, the trawlers and push netters are not allowed to operate within 3,000 m from shore. Because these gears are considered to be destructive in that they catch a big amount of trash fish, more than half of which are juveniles of economic species. Furthermore, these gears disturb the sea bed, resulting in a decline of fisheries resources.

3.4.1.3 Limited Entry

Owing to the limited fisheries resources, in 1980, the DOF made an announcement regarding the registration of trawlers and push netters in an attempt to control the number of these gears. No more licences will be issued to fishing vessels. Only the fishermen who have fishing licences can apply for an annual extension of their fishing licences. Licences will not be granted in cases of gears having been changed. The fishing licences are non-transferable to other operators except when these are fishermen's children.

Although these measures have been implemented for more than a decade, the fisheries resources unable to recover to a satisfactory level for the following reasons:

1). The number of staff and patrol boats for law enforcement is limited compared with the coastal length of 2,614 km and the huge number of fishing boats that operate various types of fishing gear.

2). The collaboration by fishermen is limited. As mentioned above, fisheries resources are treated as common property, they do not belong to anyone. Hence, the fishermen are not willing to give collaboration to the DOF for the fishery management programme. They just want to catch as much as possible each day because they believe that if they follow the fishery management programme they will be losers. The fishery management programme of the DOF is always faced difficulties in implementation.

3). The law enforcement cost is very high. The construction and operation costs of patrol boats are considerable, the DOF provides quite a big budget for them each year but it is still inadequate. Furthermore, it is doubtful whether the benefit from the recover of fisheries resources can meet the cost of law enforcement.

4).The DOF is not the only agency implementing fishery management programme. There are other Departments, for instance, Deportment of Police, Royal Forest Department, Department of Harbour, etc., concerned with the programme. Thus, it is very hard for the DOF to implement any measures efficiently. For example, the DOF wants to stop the construction of new fishing boats due to the limitation of fisheries resources but in practice the Department of Harbour is the only is the only agency that has authority to control the construction of any boat in the country.

Thus, in order to solve the problems of marine fishery, Thailand must seek other alternatives of fishery management. The community based fishery management may be the answers.

3.4.2 Coastal Small Scale Fisheries Development Program (1985-at present)

3.4.2.1 Program strategies for dealing with the small-scale fishery problems

1). Fishing Facility Construction

If the small-scale fishing livelihood is going to be gotten better, several conditions must be improved. This includes coastal rehabilitation, conservation and effective exploitation of fishery resources, and provision of basic fishing infrastructure. Living in remote areas out of reach, some small-scale fishing villages are in need of basic structures for their fishing operation, such as community landings, fishing-gear repair shops and stores, capstans, and freshwater tanks. These fishing facilities need to be developed or constructed by the government as part of nationwide socio-economic development programs

2). Coastal Rehabilitation

The coastal zone is an area of high population density, especially in small-scale fishing communities. Some of the key problems which emerge are competition for the resources, over- exploitation, the use of non-selective fishing gear, and coastal habitat destruction. The rapid depletion of coastal resources and habitats directly affects many thousands of small-scale fishermen and their families which primarily live in poverty. Many of them have to seek different alternatives which press more adverse effects on fishery resources and coastal ecology. An increasing number of villagers begins to use modern fishing gear and goes fishing further offshore to get more catch, accelerating unnecessary investments and conflicts with commercial operators. Such problem can be resolved by restoring coastal resources and habitat through effective implementation of mangrove rehabilitation, artificial reef construction, and live species stocking.

3). Demonstration and Promotion of Non-Destructive Fishing Gear

Many coastal small- scale fishermen discard their old fishing gear before they consider recycle the worn nets or the broken tools. There is apparently no intention of maintaining or repairing the fishing gear which is due mainly to the lack of the technical know-how to attempt such maintain and/or repair job. Involving the coastal small-scale fishermen in non-destructive fishing gear demonstration and promotion activities will enable them to familiar with different types of gear, to understand the impacts of certain kinds of gear on fish stocks and habitats, to learn how to apply the tools that suit particular fishing grounds, and to be apprenticed to gear repairers. In this respect the fishing gear demonstration and promotion activities will contribute towards the coastal small-scale fishermen's lower costs of fishing operation, and towards coastal resource conservation.

4).Development of Alternative Sources of Income and/or Livelihoods

<u>Coastal Aquaculture</u> ;

Aquaculture potential of Thailand's coastal areas has been well-accepted as an alternative source of income. The pond and cage culture systems along

the country's coastlines reveal how valuable and productive aquaculture can be which more than compensates for losing the exclusive fishing zones. Expansion of coastal aquaculture is also due to other combinations which make the development goes faster: depleted fish stocks that reduces capture; over-fishing; high fuel costs; and the deterioration of the aquatic environment. The technologies for effective production and processing, as well as suitable sites, are also available. Further expansion of the coastal culture devilment is therefore physically and technically feasible. Well-planned activities and effective production of cultured marine fisheries will contribute towards better livelihood of coastal communities while decrease fishing pressure on natural stocks.

Post-Harvest Production;

Fisheries, both capture and aquaculture, is a major source of animal protein for the population, particularly low-income residents in remote rural villages. Although coastal people, in general, prefer to consume fresh fish and to preserve or convert fish to various fish products, there is still a need to improve facilities and infrastructure, as human resources capability for fish handling, processing and marketing. More efforts should be made to provide training to the coastal small-scale fishery communities for making the full use of fish catches for direct human consumption.

3.4.2.2 Some Perspectives From Implementing Agency

The DOF coastal small-scale fishery development project is aimed at promoting the small-scale fishing livelihood. The project was initiated in the Fifth National Development Plan and has been implemented ever since. A variety of project activities can be grouped into five components.

1). Basic infrastructure component

This component provides fishing infrastructure necessary for small-scale fishery development to selected coastal villages. Frequent and appropriate uses of such infrastructure by the villagers thus indicate success in achieving the objective of this component. The implementing result, however, has revealed that most of these structures have not been fully utilized.

1.1) Fish landing piers and breakwaters are not fully used to capacity - only around 80 per cent of the structures are being used. The failure lies behind a few reasons:

- The structures have not been built according to strict specifications, and thus cannot be used;
- Some coastal fishermen prefer to park their fishing boats right behind their black door and unload fish house efore deliver to a fish market.

1.2) Fishing gear repair shops, fish processing house, freshwater tank, and other facilities are note fully utilized due to the following problems:

- Poor design and construction that do not make possible for the structure's practical usefulness;
- Unfavorable construction sites - several public properties made available for construction are remote from community centers, and thus are note suitable location;

-Underdeveloped raw material supply, storage and marketing systems-fishermen are not prepared for the development of fish processing and marketing.

2). Coastal rehabilitation component

A significant number of large artificial reef complexes are successfully placed in several coastal fishing ground s. According to fishermen, increasing fish stocks and biodiversity resources have been observed in and around such grounds. However, the problem still remains. Some reef complexes have been destroyed by commercial trawlers. There is s lot of debris everywhere which obstruct small-scale fishing operation.

3). Fishing gear demonstration component and Supplying

It is hard to implement the fishing gear demonstration activities which require the fishermen's co-operation and their attitude towards new livelihoods. Continuity in the activities and expansion of demonstrating modules into new kinds of fishing gear will prove a success. However, so far as project is concerned, only continuity has been observed. To overcome some of the obstacles the following is needed:

3.1) Local market conditions - a monopolized nature of the local markets will contribute significantly to the success of this component;

3.2) Attitude to wards new livelihoods and a culture - it is observed that where the fishing villagers are Muslims they tend to resist any changes in livelihoods and ways of living. An understanding of such limitation will help the official in dealing with the problem.

3.4.2.3 Fish product development component

A number of factors contribute to the success of this component. This includes a change in consumption and marketing behavior, and some adjustment to the changing environments. Whether the fishing villagers have applied the knowledge to their everyday lives and whether this has led them to change to change their livelihood are thus the measures of success. Experience show that participants of this component only use the knowledge in their everyday lives

3.4.2.4 Aquaculture component

This component would be a new source of income and an alternative livelihood to the fishermen. To develop a sustainable coastal aquaculture livelihood, however,will require good environment. Continuity in providing sound management advice and problem solution is therefore very important.

Admittedly, there has not been much progress on the project implementation. The following factors have contributed to the success or failure of the Coastal Small - Scale fishery Development Project.

1). Natural environment factors
2). Social and cultural values as perceived by fishing villagers
3). Market factors

3.3.3 Community-based Fisheries management Program (1995-1999)

The small scale fisheries development schemes, initiated since 1985 have met with some success. Facilities constructed, and artificial reefs provided to the fishing communities are tangible benefits. However, the benefits of resource management and conservation are not as clear or as understandable. Failures of fishery management programmes in the past were due to the fisheries resources being considered as common property. Indiscriminate exploitation in the past has degraded them. Thus, the strategy on a community approach initiated and improved upon community-based fisheries management has been implemented in many different areas particularly in the Phang-Nga Bay under collaboration with the Bay of Bengal Programme. The project has been conducted since late 1995 for a five year period. This project is aimed to change the perceptions and attitudes of fisherfolk from being a user to being a manager of the future. Activities on grouping, training, social development programmes (such as reforestation of mangrove, replanting of sea grass, fish stock enhancement/sea ranching, etc.), fish landing site management which unites fisherfolk, including awareness building to build up their awareness and participation in resource conservation have been implemented in the target villages. Regular meetings among the working committee of each village have been organized every two months to monitor the progress and problems of implementation in each village. Visits to the target villages have also been carried out regularly. When the fisherfolk learn how to manage and conserve the fisheries resources for sustainable utilization in the near future, laws governing the provision of fishing grounds in front of their village or group of villages as part of village property as a source of their livelihood, in other words, certain fishing rights, will be extended to them.

3.5 STRATEGIES FOR COASTAL FISHERIES RESOURCES MANAGEMENT IN THE EIGHTH NATIONAL PLAN

1. Improvement of livelihood of scale fishermen by means of improving infrastructure of fishing communities, increasing educational opportunity,improving health care and providing better employment opportunity : Aquaculture, mariculture, extension services for improvement of catch and post harvest processing in order to enhance their income and providing new employment opportunities have introduced to the communities. Establishment of fisheries cooperatives for the improvement of financial management have also been attempted.

2. ***Awareness building in marine resources conservation:*** Public campaign on conservation and sustainable uses become more important as resources are generally depleted toward the increasing number of fishermen and more efficient fishing methods. Education programme on awareness in resources conservation has been implemented in many communities.

3. ***Community-based resources management:*** The management which aims to achieve the participation of fishing communities for self resources management and self enforcement has been established in several communities in Thailand to reduce the inappropriate exploitation of coastal resources and degradation of habitats.

4. ***Artificial reefs installation:*** Several AR have been installed along the cost of Thailand to be used as one of management tools to reduce confrontation between

trawlers and small scale fishermen and to enhance coastal productivities beneficial to small scale fishermen and also to be used as habitat rehabilitation.

5. ***Establishment of marine reserves:*** Due to the depletion of natural resources, the emphasis on establishment of marine protected areas to serve as spawning ground, nursing ground for aquatic resources has been established. Fishing activities are not allowed to operate in those areas. Many coral reefs areas are declared as marine reserves.

6. ***Enforcement of fisheries law and regulations:*** To achieve the successful in resources management, law enforcement is considered to be one of important tools to get better participation of fishermen.

4. PEOPLE PARTICIPATION IN CBFM/CM IN THAILAND

4.1 PEOPLE PARTICIPATION

People participation in natural resource and environmental management has been increasingly recognized particularly in the Eight National Economic and Social Devilment Plan (1997-2001). Creating opportunities and an enabling environment to support the participation of all sectors in the development process is one of the main strategies for the national plan. In providing more opportunity for local communities and people to participate actively in natural resource and environmental management, the following guidelines at the national policy level include;

- Providing opportunities of people and communities to participate in decision making , monitoring and evaluation of public development projects likely to have an impact on natural resources and the environment. The government should facilitate continual public discussion at every step of those projects: initiation, preparation and implementation.

- Enacting the community forest legislation, in a form which is acceptable to all parties concerned, so that local people will have legal rights to protect and utilize community forests.

- Providing legal quarantines of the rights of local communities and small fishermen to participate in coastal resource management, as well as the conservation, rehabilitation and maintenance of mangrove forests, sea grass and coral reefs, to ensure sustainable use of coastal resources, especially those related to the fishing industry.

As such, in order for the sustainable utilization of coastal resources, upgrading the capacities of rural communities for economic and social development and for conservation of natural resources and environment has become the key element. The next section aims to provide information on existing fisheries and coastal community-based management programs and cases in which the programs exist.

4.2 EXISTING FISHERIES AND COASTAL COMMUNITY-BASED MANAGEMENT PROGRAMS

Private sector working for public in the area of natural resources and environmental protection and conservation can be found in the form of foundation, association, project, club, group, are project. In general they can be categorized as follows;

- Non-government organizations (NGOs) registered with the Ministry of Science, Technology, and Environment (MOSTE)

- Non-government organizations that do not registered with the Ministry of Science, Technology, and Environment (MOSTE)

- Business firms

- People organization (PO)

At the present time, there are more than 60 non-government organizations (NGOs) working for natural resources and environmental protection and conservation that are registered with MOSTE (Office of Environmental Policy and Planning, 1996). Under the Enhancement and Conservation of National Environmental Quality Act of 1992 (section 8), the registered NGOs can obtain support from the government agencies including loan from the environmental fund. In this respect, they will have to submit the proposals, by stating objectives, plans, project duration, and proposed budget, and then apply for the from the environmental fund. The committee under Department of Environmental Promotion of MOSTE will review the proposals to approve for the loan.

Fisheries and coastal community-based management in Thailand are mainly carried out with the supports of NGOs, particularly in southern Thailand (Table 6). Informal people organizations may exist before they work in association with the NGOs, but with encouragement of NGOs and university lecturers who are working as activists, the organizations become more recognized and they may establish the formal people organization, sometimes registered with MOSTE. Southern Small-scale Fishermen Association is a good example when its establishment in September 1993 was resulted from the seminar of NGOs, local fishermen, and university activists who realized the problems of coastal resources degradation that adversely affect local people well-being, and finally to the society as a whole.

Although fishery and coastal management programs in Thailand carried out by NGOs, Gos, Pos come in various forms, normally they may share the following goals or objectives.

1. Create awareness of local community in the sustainable management of coastal resources
2. Build up and strengthen the local capacity in the conservation and rehabilitation of coastal resources
3. Encourage the coordination among local communities, local government agencies, and NGOs

With regard to the fishery and coastal resource protection and conservation, the main NGOs working in these areas are Volunteer for Society Fund, Lae Tai Project, Southern Small-Scale Fisheries Association Yad Fon Association, and Wildlife Fund Thailand. Acting as the supporting and facilitating organizations in various mechanisms, financially and/or academically, there are various NGOs and POs working in association with them. The programs can be proposed as sub-projects in which the above key NGOs become the executing agency. Examples of this case are illustrated in Table 7.

There are also various businesses and private organizations that work directly, with collective activities, and indirectly, providing financial support. Private organizations that trapped with coral reef under the sea the siam Diving Association, the Thai Diver Company, and other local business groups. Their activities are conducted along the coastal area of Thailand, many times with the collaboration of the Tourism Authority of Thailand, the National Park officers from Royal Forest Department, and the local academic institutions in the area.

Table 6 Lists of non-government organizations involving in the coastal resource management in southern Thailand.

NAMES OF OF ORGANIZATION/ PROJECT	ADDRESS	TYPE OF ACTIVITIES	WORKING AREA/ SITE
Coordinating Committee For Non-government Organizations, Southern Thailand	65 Srisuda Road Amphur Muang Songkhla 90000 Tel: 074 311821	Acting as coordinating Center for NGOs in the south	Province in southern Thailand
Small-scale Fisheries Community Development	57/216 Kehasathan Khrutai Village Tambol Pawong Amphur Muang Songkhla 90000 Tel: 074 333 114	Solving problems facing Small-scale fisheries, Saving group, resource and environmental management	Songkhla Lake area (Amphur Hat Yai), Amphur Muang, Amphur Jana, Amphur Ranode, Songkhla
Lac Tai Project to Rehabilitate Songkhla Lake	68 Mu 4 Tambol Ku Khud Amphur Satingpra Songkhla 90190 or 56/9 Soi Pian Phiboon Apai Boriruk Road Tambol Kuha Sawan Amphur Muang Pattalung 93000	Management of natural Resource and environment	Songkhla Lake (Songkhla and Pattalung areas)
Wildlife Fund Thailand Under the Royal Patronage of H.M. the Queen, Wetland and Coastal Conservation Project	57/6 Paknam Road Tambol Sabarang Amphur Muang Pattani 94000 Tel: 333 227	Management of natural Resource and Environment concerning Small-scale fisheries problem	Pattani Bay and Nongjik area of Pattani
The Ruk Kukhud Committee	61/1 Mu 3 Tambol Jatigpra Amphur Satingpra Songkhla 90190	Management of local Natural resource and Environment (15 local Volunteers are fully participated in protection Of resource)	Tambol Kukhud Amphur Satingpra of Songkhla and area Surrounding Songkhla Lake

Cont.

NAMES OF OF ORGANIZATION/ PROJECT	ADDRESS	TYPE OF ACTIVITIES	WORKING AREA/ SITE
Small-scale Fishery Development Group	n.a.	Nine groups are Supported by Department Of Fisheries and Provincial Authority in Facilities and budget for Improving their livelihood condition	Villages as they settle
Study Center and Development of Pattani Bay	Price of Songkhla University Pattani Campus Amphur Muang Pattani 94000 Tel: 334 871	Providing knowledge on Legal aspects and fishery management	Pattani Bay
Small-scale Fishery Network Project under Earth Island Association	57/6 Paknam Road Tambol Sabarang Amphur Muang Pattani 94000 Tel: 333 227	Working on fishery resource **And environment problems,** In cooperation with Wildlife Fund Thailand	Pattani
Strengthening Capacity Of Non-government Organization Project under Local Community Development Institute	693 Department of Medical Science Bamrung Muang Road Pomparb, Bangkok 10100 Tel: 223 6713, 225 7293	Working on fishery resource And environment problems	Amphur Ta Chana of Surat Thani, Amphur Sichol and Pak Phanang Of Nakon Sri Thammarat
Small-scale Fisheries Association of Southern Thailand	57/6 Pak Nam Road Tambol Sabarang Amphur Muang Pattani 94000 Tel: 333 227	Working as coordinating Center for groups of Small-scale fishing Community in southern provinces	Southern provinces

Source: Department of Fishery and Lae Tai magazine (various issues)
Note: District = Amphur, Sub-district = Tambol

Table 7 Natural resources and environmental protection and conservation programs under Wildlife Fund Thailand with their corresponding activities.

PROGRAM	ACTIVITY
• Thailand Coastal Wetland Resources Project, program for conservation of wetland and coastal zone (Pattani and Phuket)	• Short-neck clam conservation at Tambol Pana Reh, Pattani • Community mangrove reforestation at Nongjik, Pattani and Thlang, Phuket • Coastal zoning for seagrass conservation at Nonjik, Pattani and surrounding areas
• Program for village conservation of sea turtle (Mai Khao Beach at Phuket)	• Promotion of sea turtle conservation program Through media, exhibition, and youth camp, in Collaboration with education institutes • Study visit of youth group from Mai khao, Phuket to Observe sea turtle conservation prolgram at Thlang, Phuket
Program for conservation counter of wetland area (Samut Songkram)	• Survey of base map on land use developing, Floras, and faunas at the site where the site Where the center is located
Program for rehabilitation of coastal resources and Small-scale fisherman organization (Tamblo Pha Klong, Amphur Tlang, Phuket)	• Community training on seaweed conservation project, Tambol Pah Klong • Community training on mangrove conservation project, Tambol Pah klog • Placement of signs for conservation zoning of coastal resources • Meeting of small-scale fishing community leaders (Pattani, Songkhla, Trang, and Pattalung)
• Program for strengthening capacity of local community in wetland and coastal resource management	• Data gathering on socioeconomic, ecological system, and natural resources of the community, NGOs in collaboration with local scholars and lectures at Prince of Songkhla University, Pattani Campus • Formulation of local groups to further formulate network of small-scale fishermen in other provinces including Pattani, Trang, Songkhla, Surat Thani, Phang Nya, krabi, Phuket, Pattalung, Nakorn Si Thammarat, Chumphon, and others.

Source: Wildlife Fund Thailand, 1996 (unpublished documents) and Lae Tai magazine (various issues).

4.3 CASE STUDY

The following cases are reviewed from published and unpublished documents, mostly obtaining from the NGOs. Additional information is obtained from personal communication with the NGOs staff. The cases include: Phang Nga Bay, Songkhla Lake, Amphur Thlang of Phuket, Sikao Bay of Trang, and Pattani Bay and Amphur Pana Reh of Pattani.

Case I Phang Nga Bay

Phang Nga Bay is located on the west coast of southern Thailand, The Andaman Sea of Indian Ocean. The Bay covers the total area of 1,960 km^2 of the three provinces Phuket (Amphur Thlang and Amphur Muang), Phang Nga (Amphur Tap Put, Amphur Koh Yao, Ammphur Takua Tung, and Amphur Muang); and Krabi (Amphur Muang and Amphur Aoluek). Phang Nga Bay consists 114 villages, with the total 21,597 households. Of which about 79% of the total population are Moslem. Main occupation of households are small-scale fisheries. With the total 5,468 fishing boats, major fishing gears used by local fishermen are gill net, trawls, push net, long line, and other nets.

Natural resources of Phang Nga Bay comprise the mangrove area of 157,192 rai and seaweed of 7,000 rai in 1992 (Lae Tai, 18). Of the total population, 13,111 or 13.2 % are fishermen.

Problem

- Declining fishery resources due to illegal trawlers and push net fisheries within the 3-kmm zone of Phang Nga Bay.

Involving organization

Main organization working in Phang Nga Bay in the early stage was Environmental Conservation Association. Two programs, namely program for community organization development of Phuket and Program for coastal resource rehabilitation of Phang Nga, were conducted with the activities covering 22 villages of Phang Nga, Krabi, and Phuket. The target areas at Phuket were villages at Pha Klog Bay and the target areas at Phang Nga were villages at Yao Nai Klang Island of Phang Nga Bay and Lam Sak of Krabi.

In 1994, Asia Foundation provided financial support for the programs to be continued. The emphasis was on the cooperation among five parties including: local people, government agencies, non-government staff, businessmen, and academic people. The two programs (at Phang Nga and at Phuket) later were combined and become collaboration program for rehabilitation of Andaman coastal resources.

Programs and activities

- Main activities of the program is to encourage local fishermen to have the conservation program for coastal and fishery resources including establishment of the boundary to protect coastal resources from the intrusion of illegal trawlers and push nets and to manage community mangrove forest.

- Other activities include the organization of youth campus in order to enhance their knowledge of environmental conservation and protection. Additional activity is the training program of fish net production of fishermen housewives in order to reduce their fishing cost and generate their household income.

- In April 1995, the meeting of local fishermen about 2,000 fishermen (600 fishing boats) from 3 provinces was organized at Amphur Aoluek of Krabi by Southern Small-scale Fisheries Association. An agreement to ban trawler and push net fisheries within 3-km zone in Phang Nga Bay was resulted.

- On April 28, 1995, small-scale fishermen representatives, deputy minister of MOAC, and the governors of Phuket, Phang Nga, and Krabi ratified on the agreement of the cooperation for rehabilitation and conservation of coastal resources of Phang Nga Bay.

- Successful program is to encourage local fishermen from stop using push net fishing gears and enforce many push net fishermen to be out of the 3,000-m zone of Phang Nga Bay area. Thus, the fishery resources were recovered as result of push net ban in the area. Thus, small-scale fishermen can earn more than 10,000 baht/month, compared with the previous earning of 5,000-6,000 bath/month.

Case II Songkhla Lake

Ban Ku Khud is one of the fishing villages located in Tambol Ku Khud, Amphur Sathing Pra of Songkhla. The village is on the outer part of Songkhla Lake facing to the urban area of Amphur Muang Songkhla. The villages faced the problem of declining fishery resources which caused the decresed earning from fishing activities. In 1991, Lae Tai Project initiated the programs for conservation and rehabilitation of natural resources in Songkhla Lake. After consultation with local people, the programs for releasing juveniles and zoning for fisheries conservation area, and the establishment of local volunteers to project resources in the resources in the conservation area were conducted.

Problem

- Declining fishery resources, freshwater and brackish water, in the Lake

- Water quality deterioration due to discharges of wastewater from urban areas and shrimp farms, treated and untreated

Involving organization

Local people in the surrounding area of Songkhla Lake work with close collaboration with Department of Fisheries and Royal Forest Department, together with other government agencies.

Small-scale Fisheries Community Development Project was established in 1981 and became the first formal people organization working at Songkhla Lake (see Table 8).

Samila Youth Center was established in 1994. Its main objective is to build up awareness and strengthen youth group for collectively work in the social development programs together with other people.

Activities

- Fishery conservation program at Songkhla Lake. Department of Fisheries, Lae Tai Project for Rehabilitation of Songkhla Lake, and private aquaculture farms have the program for releasing fish and shrimp juveniles into the Songkhla Lake since 1991, which could be counted for about 20 million pieces during 1991 to 1995. Fishing community were promoted to establish the fishery conservation zone and arrange local volunteers in protection of fishery resources. Fifteen

fishery conservation zones, covering the area from Thale Noi to Songkhla were established, with the total area of 6,500 rai, of which 10 zones were under the legal zones designated by the Department of Fisheries. The rest are not officially designated but are generally known to the community as the fishery conservation area. There are about 140 local about 140 volunteers working collectively in the conservation zones.

- Prohibition of destructive fishing gears
- Promotion of revolving fund establishment

Table 8. List of people organizations which have their work at Songkhla Lake.

NAME OF ORGANIZATION	YEAR ESTABLISHED	OBJECTIVES	ACTIVITIES
Small-scale Fisheries Community Development	1981	1.To promote options for sustainable coastal resources 2.To develop fishery processed product at the community level 3.To support the establishment of revolving fund 4.To support the network of people organization and small-scale fishermen 5.To build up people awareness in problems concerning small-scale fishermen 6.To collaborate between people organizations, government agencies, and others.	1.Promote production of chemical free vegetables
Association of Songkhla Lake fishermen	1990	1.To protect benefits for fishermen 2.To find out and solve the problems of fishermen living in the lower part of Songkhla Lake	
Sekhiyadama	1990	1.To support the development of people based on religion 2.To promote the friendship among the monks	
Loke Sodsai Nai Ban Kerd	1991	1.To find ways in solving environmental problems 2.To build up the collaboration in solving problems between people and government agencies 3.To stimulate the local government agencies play roles in solving environmental problems	
Lae Tai Program to Rehabilitate Songkhla Lake	1991	1.To develop and find alternatives to improve water quality at Songkhla Lake 2.To promote and strengthen people organization 3.To promote and stimulate people play roles in rehabilitation of Songkhla Lake 4.To put efforts in establishment of government policy to be benefited to local people	

Case III: Amphur Thlang, Phuket

Small-scale fishery commutities at Ban Pa Klog and Ban Bang Rong, Tambol Pa Klog, Amphur Thlag of Phuket are located in eastern Phuket Island where they experienced abundant coastal resources in the past decades. Declining fisheries resources were caused by the intrusion of trawler and push net fisheries into the 3,000 m zone which reserved for small-scale fishing activities. Other causes could be due to the reduction of mangrove forest as the nursery area for small fishery resources and the destruction of coral reefs that serve as the fish habitat.

Karon, Kata, and Patong Beaches were used to be the spawning and nursey grounds for sea turtles. Due to the tourism development, people reported that sea turtles were no longer seen in the area (Wildlife Fund Thailand, 1996). Nai Yang, Mai Khao, Suan Maprao, and Sai Kaew Beaches, with about 10 km long, are still the usual places for sea turtles to lay eggs, although the number of sea turtles coming were declined, before the collective activities of local people for sea turtle began.

Sea turtles are protected under the Ministerial Degree of Ministry of Agriculture and Cooperatives (MOAC) issued under the Fisheries Act of year 1947. Any harmful activities to sea turtles and their eggs are prohibited. However, in the real situation, sea turtle eggs for sale are normally found and sea turtle shells and their products are sold for the souvenirs.

Problem

- Declining fishery resources available for small-scale fishermen

- Threatened sea turtle population at Mai Khao Beach of Phuket

Involving organization

At Phuket the Environmental Conservation Association of Phuket was long established with the objective for the environmental and protection from development projects.

Thailand Coastal Wetland Resources Project under Wildlife Fund Thailand conducts the activities in the two provinces, Phuket and Phang Nga. At Phuket, two major programs were proceeded (1) the program for coastal resources rehabilitation and small-scale fisheries organization and (2) the program for village conservation of sea turtle.

Programs and activities

- In 1990, the development projects for resort and golf course at Mai Khao Beach were protested successfully by Environmental Conservation Association of Phuket.

- The program for coastal resource rehabilitation and small-scale fisheries organization included two main activities (1) seaweed conservation and 3-km zone management and (2) mangrove conservation and community forest project.

- On March 26, 1994, the placement of artificial reefs were done by local people supported by voluntary women group, provincial community development office, and Phuket governor. On April 13, 1994, which is the National Fisheries Day, the juvenile fishery resources (fish, turtle, and shrimp) were released with support from provincial fisheries office and concerned agencies.

- Regular inspection of the intrusion of trawl and push net fish boats into the 3-km zone were done by local people, coordinated by provincial fisheries office. Local fishermen and scientists from Phuket Marine Biological Center conducted research on effects of trawler and push net fisheries on juvenile fishery resources. Another research was the effect of zoning for seaweed conservation on the increase in fishery resources.

- The program for village conservation of sea turtle was conducted by the Environmental Conservation of Phuket with the budget supported by Wildlife Fund Thailand. The program started during October 1990 to April 1991. The main activity was to build up awareness of local people in order to realize the importance of sea turtles and environment. Campaign through exhibition and media in schools and public places in Phuket and nearby provinces were formulated. Youth campus were arranged to enhance knowledge on the importance of sea turtles and environment. Local people together with field staff from Wildlife Fund Thailand collected sea turtle eggs, hatched, and released the small turtles back to the sea.

Case IV : Sikao Bay, Trang

Collective actions in protection of coastal resource degradation by local people at Sikao Bay were recognized before 1984: Initially, main activity of the villagers was an attempt to prevent the use of destructive fishing gears by local fishermen of the community. The activity was later included the mangrove conservation programs and extended to the seaweed conservation program in front of their villages (Lae Tai, 12). Unit at the end of 1985, the villagers obtained the strong support from the Yad Phon Association in their conservation programs. The mangrove reforestation of Ban Thung Tong later became the first community forest of Thailand.

In 1966, local people at Ban Laem, Tambol Wangwon, Amphur Kantang of Trang was organized, as inspired by the collective activity of local community at Sikao Bay. The Oyster Conservation Group was established with the members of about 100 persons (Lae Tai, 30). The main activity is to establish the conservation area of 150 x 1500 m^2 for oyster.

Problem

- The villagers from 17 villages of Sikao Bay proposed to the government for the rights in protection and utilization of their coastal resources and for the answer of no longer concession program of mangrove in the community.

- After the effective prohibition of the intrusion of trawler and push net fisheries into the 3-km zone, the villagers found that the coastal resources became more productive which caused higher earning to local small-scale fishermen.

Case V: Pattani Bay and Amphur Pana Reh, Pattani

Pattani Bay covers the total area of 74 km^2 facing the Gulf of Thailand to the west. With its estuarine area for Yaring and Pattani Rivers, the bay is rich with natural resources, abundant mangrove forest and nursery areas for fishery resoueces. The community at Pattani Bay is mostly living at Tambol Lam Pho of the Bay in 4 villages including: Bang Dato, Ban Talo Samilae, Ban Kampong Budee, and Ban Pata Budee. The community is mainly Moslem with its livelihood is small-scale fisheries.

The coastal area of 15 km^2, about 2,000 m from the coast line, of Amphur Phanare, Pattani is abundant of short-neck clams. The Department of Fisheries (DOF) estimated that the available resources could be valued up to 500 million baht (Lae Tai, 12). In March 1992, the concession of shot-necked clam fisheries in Amphur Pana Reh were given by DOF to 30 fishing boats. However, the concessed boats entered into the 3-km Zone which reserved for small-scale fisheries. As such, in April 1992 local people, religion leaders, and village leaders protested and requested to the governor not to allow the concession of short-neck clam fisheries in Amphur Pana Reh. The concession was successfully stopped.

On July 28, 1992 the Ana Reh Coastal Fisheries Association was established as people organization with the objective for the conservation and rehabilitation of coastal resources of Amphur Pana Reh. Its ultimate goal is to improve the living conditions of the small-scale fishermen in Pana Reh to be sustained with their own coastal resources.

Problem

- Declining fishery resources in the Bay causing from large fishery such as trawlers and push nets within the 3-km zone.

Involving organization

The Association of Small-scale fishermen was established in March 1993 through exchange of information and discussion among villagers in solving problems regarding fishery resources degradation. The association is chaired by the sub-district leader of Tambol Lam Pho with members from 4 villages of Lam Pho. The Pattani Bay Rehabilitation Organization was later established in September 1993.

Programs and activities

- The "Pattani Bay Conservation" Day was established on May 11, 1993. The activities for this day, in collaboration with government agencies, included the placement of conservation zone for fishery resources and seaweed, and the release of shrimp and fish juveniles into the Bay.

- Study visit of 850 member representatives was organized during June 14-16, 1993. The trip to Pattalung, Trang, Phang Nga, and Phuket was aimed at representatives to observe, discuss, and exchange information with local people who were actively working on coastal conservation programs.

- Survey of coastal resources in Lam Tachi of the Bay was conducted on June 21-25, 1993 by fishermen and divers from Wildlife Fund Thailand. The data from survey were prepared to support the government agencies in planning for coastal resource development and management of the Bay.

- Mangrove planting was arranged by the association which close collaboration of the regional forestry office of Pattani on August 521, 1993. The objective was to rehabilitate the existing mangrove area to become the community forest area for the villagers of Ban Dato and Ban Talo Samilae.

- Seminar on "Past, Present, and Future of Pattani Bay" was organized on 5-6 September 1993 in order for the concerned parties, government, non-government and local communities, to brainstorm for the future plan of sustainable coastal resources in the Pattani Bay. On September 6, the Pattani Bay Rehabilitation Organization was established as the result of the seminar.

5.KEY FACTOR FOR CBFM/CM IN THAILAND

Key factors for success/failure of adopting CBFM/CM in Thailand will be considered. As mentioned earlier in Part 2 of this report, CBFM/CM has limitation when being applied in a country where there are inadequacies in supporting physical conditions, institutional framework, and socio-economic conditions. Costs and time involvement constrain the success of adopting CBFM/CM.

Costs of adopting CBFM/CM consists of transaction costs and governance costs. Various factors affecting physical conditions, institutional framework, and socio-economic conditions determine these costs. At the same time these factors also determine time to be taken in adopting a successful CBFM/CM in Thailand.

5.1 PHYSICAL CONDITIONS

There are three components in physical conditions; fishery resources, fishing ground, and fishing activities.

5.1.1 Fishery Resources

Most of the coastal fisheries in Thailand are multi-species multi-gear fisheries. Interdependence among these species and fishing activities are complicate. Beside, it has often been found that fishermen are keen of adapting their fishing practice to accommodate the changes in resource abundance. Management for such fisheries must be flexible and able to cope with such quick changes and their interactions. The inadequacy of scientific information on fishery resources including the stock, biological concerns, interrelation among different aquatic livings reduces the success in usual fishery management.

Ecology is another important factor in this part. Limited knowledge on complex ecological system, both in the sea or on shore is a problem on designing effective fishery management plan.

CBFM/CM relies on indigenous knowledge of the local people who make their livings from fishing and allows them to apply the knowledge on management the resource once the right has been granted.

Nevertheless CBFM/CM is recommended only when resources are being depleted. The closer to the critical level the more likely that the community will effectively share the information and cooperate in resource management.

The success is more likely where fishery resources are mainstays the people in the community. The more they have to rely on fishery resources the higher value they recognize, thus the more willingness to cooperate in CBFM/CM scheme.

In term of exclusivity, management on sedentary species is less difficult than migratory species. Most of the coastal fishery targets are sedentary species.

In the community where fishery resources are being depleted while there is limited scientific information on multi-species multi-gear fisheries and there is an immediate need of effective management, CBFM/CM can be recommended.

Case studies in Phang Nga Bay and Sikao Bay are examples of such cooperation in CBFM/CM development in these areas.

5.1.2 Fishing ground

Exclusivity is a key factor. CBFM/CM is unlikely to be successful in community where the fishing ground cannot be exclusive to the community. At early stage of CBFM/CM development, emphasis is usually on renewal resource abundance. Once fishery resources have been rehabilitated, the fishing becomes more attractive to fishermen, both from the community and outsides. There can be various measures to be adopted in reducing encroachment by the outsider, but those measures can take time to come into effect and there is still question on equity. Geographical barrier is an answer to this immediate exclusivity. Without exclusivity at the beginning, the community cannot be assured of the right over the resource, thus reduce their willingness to cooperate in adopting CBFM/CM.

Sikao Bay is an example where geographical barrier allows. Fishing villages are scatters along shoreline of a semi-bound fishing grounds. Encroachment by outsiders can easily be observed. Upon collaboration of the coastal communities, encroachment by unacceptable fishing gear is difficult. In Phang Nga Bay fishing practices are more diversified while the fishing ground is more open. It is more difficult to handle with the encroachment by motored push net and trawl in Phang Nga Bay. Village sites among those communities cooperation in CBFM/CM are more scattered and isolated, thus more difficult for surveillance. Volunteer group has been organized in each Bay. Nevertheless, there is no legal support on enforcement by this group. Once encroachment is found, they have to report to local government authorities to take legal action, which may not be in time. Such delay can lead to dispute, fighting, and death. It would be difficult for coastal small scale fishermen to fight with armed larger scale fishermen who use destructive fishing gears.

Artificial barrier can be constructed but it must not be against navigation law and regulations under the control of Department of Harbor. Where CBFM/CM is to be launched in the area where natural barrier is partially allowed, there should be collaboration between three government agencies i.e. Department of Fisheries, Department of Habor, and Local Government Office in enhancing barrier for the community exclusive fishing ground. Artificial barrier enhancement can be artificial

reef, cage culture or other coastal culture which make difficult encroachment by motored push net and trawl.

5.1.3 Fishing Activities

In the community where fishermen use multi-gears and successive fishing in response to changes in composition of fish resource abundance, CBFM/CM is likely to be recommended as the tradition management scheme may not be applied effectively. Collaboration among fishermen will lead to an agreement on sharing resources which property right has be granted to them, thus optimum exploitation on those resources.

Heterogeneity among the fishermen is another important factor. Launching CBFM/CM in a community with heterogeneous fishermen can lead to conflict and difficult agreement on management plan. Beside, in a community where there are poor small scale coastal fishermen along with successful rich fishermen, it is likely that the first group, even being majority in number will keep silence and be dominated by the second group. Once resource rehabilitation under CBFM/CM plan has been successful, the second group being more efficient can reap out the benefit before the first group. Inequity resulted from heterogeneous fishermen reduce the success of CBFM/CM.

It is not recommended to launch CBFM/CM in the community where there are varieties of occupation. Where fishery resources has been depleting, provided alternative source of income fishermen can leave fishing for the more promising occupation. This, at the same time, is automatic reduction in fishing effort, thus renewing fishery resource abundance. Conflict of interest among different occupation can lead to difficult fishery management plan by that community.

CBFM/CM in the case studies in Part 4 are in the communities where fishermen are not heterogeneous. They share a common goal in adopting CBFM/CM.

5.2 INSTITUTIONAL FRAMEWORK

5.2.1 Law and Regulation

In Japan to support development of CBFM/CM, there had been three categories of law i.e. Fisheries Law 1949, Fisheries Resources Conservation Law 1951, and Fisheries Cooperative Law 1948. These laws provide legal framework for management and rehabilitation of fishery resources while strengthening community capability in managing fishery resources once fishing right has been granted.

In Thailand Fisheries Law 1947 had been enacted on the basis of freshwater fisheries which was the leading sector by that time. Section 32 of Fisheries Law 1947 allow Minister/Governor to issue fishery regulation. Most of current regulation are issued under this Section. Other relevant sections are Section 6 and Section 7. Section 6 divides fishing ground into four types; sanctuary, auction, permission, and public areas. Section 7 grants provincial committee the authority under approval of the Minister to announce specific fishing in their location as sanctuary, auction or permission. Those fishing grounds which have not been announced so will automatically be public fishing grounds.[13]

[13] Chumejate Garnjanaarksorn and Somboon Yeneng, 1976

Existing Cooperative Law in Thailand has been designed in general, without specific target on fishery cooperatives. Most of agricultural cooperatives in Thailand, including fishery cooperative have been working on the basis of group collective on the purpose of obtaining credits from Agricultural and Cooperative Bank. Other cooperative functions have not been efficiently undertaken. Unlike Japan, fishery cooperative performance in Thailand has not been strong enough to act as a core unit for CBFM/CM development.

Section 6, 7 and 32 of the Fisheries Law 1947 can be employed as a legal framework for CBFM/CM.

5.2.2 Village Organization

Recently, it has been recommended that Sub-district Administration Authority (Or-Bor-Tor) can be chosen as a core unit for development of CBFM/CM. Committee of this authority consists of sub-district head and village head (2 persons at most) by their positions, and 4 members from Sub-district Council. Members of Sub-district Council are those by their positions including sub-district head, village heads and sub-district doctor and those elected representatives from each village. Sub-district Council with an annual revenue of 0.15 million baht (not including subsidy from the government) in three consecutive years can be promoted to be Sub-district Administration Authority. It was anticipated that by next year there would be Sub-district Administration Authority in each sub-district.

If CBFM/CM is to be developed in a community where coastal fishermen are dominance, it is likely that assigning Sub-district Administration Authority as a core unit will be a supportive framework for a successful CBFM/CM. Nevertheless if CBFM/CM is to be developed in community where occupations, means of livings, are various, it is likely that there will be conflict of interest which can lead to an unsuccessful CBFM/CM.

In our case studies successful CBFM/CM have been existed before development of Sub-district Administration Authority. The core unit for these successful CBFM/CM is scaled down to coastal village level. Collaboration among nearby villages have been sought where necessary and partially coordinated by either NGO or local government offices or both. Bringing in Sub-district Administration Authority in full scale may lead to conflict of interest, thus delay the development of CBFM/CM. Nevertheless one advantage of having Sub-district Administration Authority in CBFM/CM is to reduce the problem of equity in access to resource. Still, efficiency of Sub-district Administration Authority has to be carefully considered before involving this authority in CBFM/CM.

Village organization is one of the weak point in developing CBFM/CM in Thailand. Coastal villagers are usually poor and low educated. Down the South most of them are Moslem, strongly religious disciplined. There are opportunities to select village where there exists strong leadership. Examples are Sikao and Phang Nga. NGO can take role in extending, financially and technically, empowerment programs in strengthening community capability, at least in resource rehabilitation and conservation while the government can undertake extension programs on appropriate fishing techniques and improving income through a better resource utilization.

5.2.3 Fishing Right

Granting fishing right is required in development of CBFM/CM. With the right over fishery resources, people can be motivated to effectively participate in fishery management. Attempt has not been put into practice in granting fishing right to the communities. Equity is the problem. There is reluctance in granting fishing right to a specific group as fish are common property resource.

As mentioned earlier it will be difficult to adopt CBFM/CM simultaneously across the country. CBFM/CM development should be selective where physical conditions and village organization allows. In a community where fishing boundary can be defined, pilot project on CBFM/CM can be undertaken. Fishing right can be granted upon Section 7 of the Fisheries Law, announcing the fishing ground to be permitted area giving permission to the community. Government support on enforcement is required, especially in the early stage of development. With limited budget on enforcement, it is not possible for the government to take effective enforcement all along the country coastline. However in this selective site, effective enforcement is required. Even in successful cases as Sikao and Phang Nga, there has been problem of inadequate support on legal enforcement which delays the success. For a successful CBFM/CM, such support is needed at least in the specific selective pilot locations.

5.2.4 Basic Infrastructures

Government programs as mentioned in Part 3 have put effort in providing some infrastructures for coastal communities. Examples are landing piers, fishing gear repair shops, and coastal rehabilitation including artificial reefs. Interesting activities are those technical extension on appropriate fishing gears for coastal small scale fishermen which incorporate activities on procurement of necessary inputs and promotion on cooperation in catch distribution among these fishermen. Being undertaken by DOF these programs focus mainly on fisheries.

Recently to develop CBFM/CM, the government programs include strengthening community capability in fishery resource conservation and thus management. NGO activities on enhancing community role in natural resource conservation have been found in several places. Under the Enhancement and Conservation of Natural Environmental Quality Act 1992, there has been more cooperation among the NGOs, PO and government agencies.

Most important basic infrastructures required for development of CBFM/CM are those concerning with strengthening community capability in fishery management, building up a strong and capable village organization; a time consuming and costly program. People and their collaboration are the key factor.

CBFM/CM is recommended to be introduced in the community where investment on building up community capability is relative low. In these communities people must recognize value of fishery resources, Collaboration will increase if they can be assure of the net benefits to be received from participation the management programs which in is a cost to them. Such benefits should be visible, quick, and proportionate such that they can be attractive for the collaboration. Up until now there has not been any clear evidence on such benefits. Despite these inadequacies, CBFM/CM has been developed, at some level of success in our case studies.

Key factor for success here is to launch CBFM/CM in a community where there are strong leadership being capable of undertaking their resource management. Assurance on benefits from participation in the management program is the key for effective collaboration.

Effective management plan relies on an accurate information on fishery resources. Indigenous knowledge from the community may help in early stage of development. Nevertheless if local fishery station can cooperate with the communities in research and practical dissemination of the research results among the community, both will gain in administer their fishery management plan.

5.3 SOCIO-ECONOMIC CONDITION

CBFM/CM is likely to be successful in the community of artisanal fisheries than commercial scale fisheries. Artisanal fisheries are often small scale coastal fisheries using traditional non-destructive fishing gears within nearby fishing ground, usually within 3 km from shoreline. Fishing income is the main income for this community. They are subsistence fishing household who rely mainly on fishery resources. Once fishery resources have been depleting, there is a limited or no alternative for their livings. In Thailand there are conflicts in resource utilization among these artisanal fisheries and the commercial scale trawl and motored push net. These artisanal fishermen put high values on fishery resources and are more willing to participate in fishery resource rehabilitation program to make their livings.

The selected community besides being artisanal fisheries without alternative source of income should be a community with long history of fishing. Local people in such communities have an accumulation of indigenous knowledge about fishery and other natural resources, including knowledge on ecological complexity around their villages. These knowledge are useful for an appropriate fishery management plan.

It would be better to launch CBFM/CM in an artisanal fishing village with relative strong village organization. In Thailand village with long history usually develop a recognized social pattern within their villages. Community leaders can be specified and they are capable to act as leading decision-making. Usually such leaders are senior active village heads. Religious leaders also, play an important role, especially in Moslem villages. In such community, social norms and custom supporting effective fishery regulation and enforcement usually avail. Governance costs will be relatively low in these villages.

Financial support will be useful at the early stage of development. According to the above criteria, CBFM/CM will be introduced in a poor village with limited resources. Initially there can be need for expenditure in organizing the group and getting people actively participating in management plan. During the period of fishery resource rehabilitation, there should be some financial support for this subsistence fishing households.These people should be assure of their visible, quick, and proportionate returns once the resources have been rehabilitated.

Market development can be a factor of failure. Fishery resources are overexploited because of market failure in this common property resource. CBFM/CM is expected to correct such failure granting fishing right to the community. If the

community has a justified control on the outlet of their catches, the regulation can be more easily enforced.

6.CONCLUSION

For a successful launching CBFM/CM it is recommended that pilot project on CBFM/CM should be undertaken in specific location that suit the key factors aforementioned. Government support on legal framework is an important factor of success. NGO can have an important role in strengthening community organization, especially in the part of resource rehabilitation. Government support on appropriate technology for sustainable resource utilization is a helpful factor.

Nevertheless on important key factor of success is that decision on the management plan should be made by the community, not the central or provincial authority. Government authorities should take the role at the supporting level (invest in and provide the needs at an adequate level, act as consultant on developing management and supplies adequate information on management planing, select an appropriate location with high chance of success in developing CBFM/CM); act as co-manager not decision maker.

Once there is successful pilot project, uplifting the living conditions of the coastal poor, it will be less difficult in extending development of CBFM/CM in the other areas.

References

Amornrattanaserikul, S. "Seagrass conservation : awareness of coastal community at Trang" Forest and Sea Magazine January 1994, 1(6)

Asia Foundation. One year of Coastal Resource Rehabilitation Program of Phang Nga, 1995

Copes, Parzival. Factor Rents, Sole Ownership and the Optimum Level of Fisheries Exploitation. The Manchester School, June edition 1972, Vol. 40, pp. 145-163

Eggertsson, Thrainn. Economic Behavior and Institutions. Cambridge Surveys of Economic Literature. Cambridge University Press. 1992

Eggertsson, Thriann. Economic Perspectives on Property Rights and the Economics of Institutions. Beijer Discussion Paper Series No. 40. 1993

Garnjanaarksorn, C. and S. Yeneng. Review on Regulation and Laws for Coastal Community Fishery Management. Coastal Community Fishery Management. Department of Fisheries, Thailand. pp. 54 - 56

Hannesson, Rognvaldur.The role of fishermen's organization in fisheries management of developing countries (with particular reference to the Indo-Pacific Region), Studies on the Role of Fishermen's Organization in Fisheries Management. FAO Fisheries Technical Paper 300, 1992

Jullasorn, S. Resource and Fishery Conditions in Andaman Sea, Thailand, Coastal Community Fishery Management Department of Fisheries, Thailand. pp. 7-10

Lae Tai (..) Rehabilitate Songkhla Lake by Establishment of Fishery conservation Zone

Lae Tai (12) Community Right for Coastal Resource Management for Sustainable Development

Lae Tai (14). Artisanal Fishermen in the Restoration of the Sea

Lae Tai (17). Association Complaint on the Shrimp Farm around Songkhla Lake

Lae Tai (18) Small-scale Fishemen at Phang Nga Bay

Lae Tai (various issues) Column Information on NGOs and Pos

Narayan, Deepa. Designing Community Based Development. Social Policy and Resettlement Division. World Bank. 1995

Pimoljinda, J. Resource and Fishery Conditions in Phanga Nga Bay. Coastal Community Fishery Management. Department of Fisheries, Thailand. pp. 11-29.

Wildlife Fund Thailand. Unpublished documents

Wildlife Fund Thailand (1996). An Attempt to Protect Mangrove Forests WFT Bulletin, May-June 1996.