# PART THREE

# PAPERS PRESENTED AT THE WORKSHOP

# THE POLICY OF THE DEPARTMENT OF FISHERIES FOR COMMUNITY-BASED COASTAL FISHERIES MANAGEMENT

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# 1. INTRODUCTION

Marine and coastal resources include all renewable and non-renewable resources situated in marine and coastal areas, such as water, lands, minerals, animal and plant species. The marine and coastal waters, together with bordering coastal lands, support a variety of important economic activities including: shipping and ports, oil and gas development, fisheries, coastal aquaculture, coastal forestry, coastal agriculture, mining industry, tourism, transportation and communication, and coastal community activities (CIDA, 1987; Brahtz, 1972). Many coastal states have increasingly looked to the resources of their coastal areas, territorial seas, archipelagic seas and exclusive economic zones (EEZ) for enhancing economic development and employment opportunities in the future.

The multiplicity of uses in coastal zone areas, coupled with increasing numbers of users, has generated a number of important issues at the local, national, and international levels. These issues have arisen as a result of the many different ways in which coastal resources are used and because so much of the world's population lives, works and plays in or near coastal areas (Schaefer, 1972; Burbridge, 1982). Conflicts have developed over environmental protection, pollution, urban development, and the utilization of resources for the satisfaction of basic human needs, including fisheries. It is widely acknowledged that coastal area management and planning is required for all coastal states as means of ameliorating these conflicts (Burbridge, et *al., 1988*). However, such coastal area management and planning by different governmental agencies. Therefore, these governmental agencies usually have their own policies and plans for implementation. For example, the Department of Fisheries has its own policy and planning for managing coastal fishery resources.

This paper reviews the situation of coastal fishery resources in Thailand and addresses the policy of the Department of Fisheries concerning coastal fishery resources, particularly community-based coastal fisheries management.

# 2. THAILAND'S COASTAL RESOURCES

# 2.1 Definition of coastal area

From the biological viewpoint, as from other viewpoints, it is difficult to define the coastal zone precisely. It is roughly described as the sea and land adjacent to the interface, encompassing that region where terrestrial activities importantly impinge on the marine environment, marine resources, and marine activities, and where marine activities importantly impinge on the environment, resources, and activities of the land. Obviously, no precise boundaries can be given, since the intensity of this interaction is greatest at the water's edge and slowly fades out as one moves away from the interface in either direction. This region contains the most intense interaction, from a few kilometers back of the beach to perhaps 10 or 15 kilometers offshore. From a biological viewpoint, one cannot regard this zone as isolated from other regions of either the land or the sea because of the migratory nature of many of its organisms, as well as because of the influences on the biota in this zone of natural processes, and man's activities, both on land and sea (Schaefer, 1972). For example, numerous species of fish that inhabit the coastal zone are highly migratory, just as are many species of land and seabirds that are, in part, dependent on it. Also, some juvenile and early adult stages of marine organisms are inhabitants of the coastal zone. For example, the larval and juvenile stages of tiger prawn live in the open sea for many months before becoming members of the benthic community organisms of the inshore zone. Conversely, some marine species that as adults live well offshore inhabit the inshore zone during their early juvenile stages.

The Department of Fisheries (DOF) views the coastal area as the area affected by tidal variations and climate of the sea. However, the coastal zone is biologically unique and of special importance in several ways. It is a region of very high productivity due to a number of physical processes. Nutrients, such as phosphates, nitrates, and biologically important trace elements reach the inshore margin of the sea from the land by rivers and other forms of runoff. Coastal upwelling is also an important means by which the plant nutrients in the photosynthetic upper layer of the sea are regenerated in the coastal zone, and also to some considerable distance in the open sea beyond. There is the existence of unique habitats in coastal areas as well. These include river estuaries, semi-enclosed embayments, salt marshes, littoral and sublittoral mud flats, and tidal pools. In each of these habitats exist communities of plants and animals that are endemic – in other words which live only in these particular environments. Because of this richness and diversity of habitats, the coastal zone has an extremely varied, and in many respects unique, biota.

For the purpose of discussing coastal resources in Thailand, DOF will define the coastal area as an area starting from the formation of mangrove forest or other landward boundaries to a distance of 5 km upland from the seashore and extending seaward to 3 - 5 km. These boundaries are not fixed, and in fact should be adjusted where resource interactions

fall outside the described limits. For example, in situations where upland deforestation and consequent soil erosion adversely affect deposition rates along the coast, the landward boundary of the coastal zone could be logically extended further inland to encompass the entire watershed.

#### 2.2 Thailand's Coastal Areas

Thailand has two coasts with a toral coastline of approximately 2,500 miles, covered by sandy beaches, mangrove forests, cliffs, rocky beaches, and salt marshes. The coastline along the Gulf of Thailand has a length of 1,870 km. The western coast of Thailand along the Andaman Sea of the Bay of Bengal has a length of 800 km, extending northward from the Malaysian border to the Burmese border. The Gulf of Thailand, which is typical of the Sunda Shelf, is an integral part of the Asian continent and South China Sea. It is relatively shallow, with a mean depth of approximately 45 meters and a maximum depth of approximately 80 meters (TDRI, 1987). Only few decades ago tropical areas in general were considered to have a very low productivity (Marr, 1976). In fact, the tropical seas can be very productive, Chullasorn and Martosubrato (1986) state that the waters in Southeast Asia constitute one of the most productive areas for commercial fisheries in the world ocean. The total annual catch from this region has increased steadily throughout the years and has reached about 7-8 million tons recently, which accounts for about 10 per cent of the world total marine production (FAO, 1989).

Productivity is high in the continental shelf areas, although low in the surface waters of the deep areas. Generally, enrichment is brought about by vertical mixing in the shelf areas, river discharge, and upwelling. In the Gulf of Thailand, vertical mixing over the continental shelf is the main mechanism for nutrient replenishment in the surface layers, followed by river discharge and upwelling in that order (TDRI, 1987; FAO, 1982).

Thailand's coastal habitats are biologically complex in response to variability of their taxonomic composition, overall community structure, topography, and oceanographic conditions. In gross terms, however, nearshore ecosystems commonly comprise several interdependent habitats: mangrove forests, coral reefs, seagrass meadows, and mud bottoms.

The ecological and economic importance of these habitats to communities of the coast extends beyond the particular exploitable species within them. Coastal habitats provide the foundation for artisanal fisheries, aquaculture, wood production and fuel, village settlements, tourism, urban development, port and harbor, and other numerous activities.

#### 2.3 Ecological Functions of Coastal Resources

The biological complexity and variability of tropical nearshore environments are perhaps only exceeded by tropical rain forests. Taxonomic composition, overall community

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structure and topography conditions vary widely along the coastal zone, even over short distances. Nevertheless, nearshore ecosystems commonly comprise three distinct, but intimately interdependent habitats: mangrove forests, coral reefs, and seagrass meadows and unconsolidated sand or mud bottoms. The ecological and economic importance of these habitats extends beyond the exploitable species that use them and is described below.

#### Corals

Corals and coral reefs are a dominant shallow-water feature of tropical marine environments that are remote from major upwellings or freshwater inflows. Broadly defined, a coral reef comprises both the physical structure formed from calcareous secretions of corals and other marine organisms. Large coral colonies may contain tens of thousands of individual polyps, and reefs can be hundreds or thousands of years old. It is the carbonate skeletons of these shallow water marine organisms that form the massive reef structures protecting coastlines and creating habitats for the associated biota.

Functions of economic importance of coral reefs are: (1) the creation of complex habitats for a variety of fishes and other important organisms; (2) the role of reefs as a barriers to storm waves and debris; and (3) the aesthetic and recreational values of reefs in attracting coastal tourism.

#### Mangrove forests

Mangroves are salt-resistant trees with stilt roots or pneumatophores growing in the intertidal range along ocean shores or estuaries. Mangroves are an integral component of coastal ecosystems and fulfill many fundamentally important functions in coastal ecology and the local economy. Mangroves supply wood and other forest products and contribute to the coastal productivity. As prop roots develop and spread, they trap and stabilize terrigenous sediment, building land that helps to protect reefs, bays and lagoons from agriculture and urban pollution. Like coral reefs, mangrove forests protect coasts from storm damage; support an extremely diverse and ecologically important community of marine plants, invertebrates, and seabirds; and provide shelter and nursery for a range of commercially important fish. Mangrove detritus provides an important nutrient base for food webs that include commercially important food fish and invertebrates, and augments the growth of adjacent seagrass and coral reef communities.

If mangrove forests are carefully managed, they can sustain a high fisheries output and a limited forestry production. Mangroves are harvested for fuel and building materials. However, they have been removed in many areas, often to gain access to sites used for aquaculture, tin and sand mining, navigation channels, waste dumping, and the construction of buildings, docks and marinas.

#### Seagrass beds

Seagrass and mud bottoms within lagoons and between the shore and reef crest serve many crucial ecological functions of direct and indirect economic importance to coastal communities. Although the seagrass itself is of little intrinsic economic value, the associated sand, coral rubble, fish, and invertebrates are commonly harvested for materials and food throughout coralline areas of Thailand.

The sand and mud bottoms on which seagrass beds form create a habitat for many burrowing and benthic organisms. The leaves and interwoven roots provide extensive shelter for small organisms and grazing surfaces for a variety of species. Many species migrate to and from seagrasses either daily or at fixed stages during their life cycle. For example, although many food fish live and are harvested in the coral reef areas as adults, they pass the crucial larval and juvenile phases in the protection of seagrass beds. Seagrass beds provide additional feeding areas for species on nearby reefs, and the variety of fish species tends to be higher on reefs close to these habitats.

Seagrasses promote settlement and consolidation of sandy sediments, thus helping to prevent coastal erosion. They accumulate sand on which mangroves further consolidate the land. To some extent they can absorb organic wastes and sediment. However, heavy sedimentation can cut off light to bottom communities and eventually smother them. Seagrasses are particularly vulnerable to dredging and to anchor and propeller damage; holes cut in the bed may take years to regenerate. Under natural conditions, it may take decades for a seagrass bed to recover from stress damage once the impact has ceased (McEachern, 1988).

### 3. ISSUES OF THAILAND'S COASTAL FISHERIES MANAGEMENT

There are numerous issues for coastal fisheries management in Thailand. They can be briefly described as follows:

#### 3.1 Unclear Definition of Coastal Area

As a matter of fact, there is unclear definition of the coastal zone. The Department of Fisheries (DOF), as mentioned earlier, views coastal areas as areas affected by tides and the climate of the sea. The landward area covers mangrove forests and the seaward extends to 3-5 km from the shoreline. This area is characterized by biological diversity of plant species and animal species. In addition, there is a regulation imposed by the power of the Fisheries Act, B.E. 2490 (1947) protecting the area of 3 km from the shoreline throughout the coastal area of the country.

#### 3.2 Institutional Arrangements

There are many government agencies involved in different activities in coastal areas of Thailand. These government agencies include the Department of Fisheries (DOF), Royal Forestry Department (RFD), Department of Harbour, Office of Environmental Policy and Planning (OEPP), and National Economic and Social Development Board (NESDB), among others. In addition, at the local level, there are various Provincial Offices located along the coastlines and municipal offices in coastal provinces also involved in coastal activities. These government agencies have their own policies, plans and legislation for managing coastal areas pertaining to their disciplines.

The combination of a number of government agencies and an unclear definition of the coastal zone has led to overlapping jurisdictions and frequent conflicts of legislative power and administrative authority in many aspects of management. In response, Thailand has initiated the formulation and integration of a coastal zone management plan at the national level. However, the plan has not yet been completely formulated and integrated. In addition, many pieces of legislation have not yet been amended as well. Still each agency continues to manage coastal areas according to its own policy and planning. Thus, the management of coastal areas in Thailand is quite ineffective.

#### 3.3 Human Settlement

The types of human settlement along the coast in Thailand can be classified into five categories – fishing villages; fishing and farming villages; farming villages; urban and industrial communities; and migratory communities (Adulavidhaya, *et* al, 1982). Fishing villages are the most common along the Thai coasts. Fishing villages are located in estuaries and along the shores. These villages are generally settled in clusters. The size of fishing villages varies from very small *(i.e.,* composed of 20-30 households), to very large villages composed of several hundred households. Panayotou, *et* al. (1985) infers a total number of 90,200 fishing households in the 1,563 fishing villages of the 23 coastal provinces, bringing the fishing-dependent population up to 800,000 -1,000,000. People in fishing villages are usually engaged in small scale fisheries with simple technology. These villages are generally self-sufficient (TDRI, 1986).

Fishing and farming villages are mainly scattered along the east coast and the southern provinces. People in these communities engage in rice farming as a supplementary occupation. The standard living of these people is relatively better than those living on fishing alone (Rientrairut, 1985). But rice production is rarely sufficient for household consumption. Increasing salinity of the soil, population growth which has placed additional pressure on land use, and lack of interest in rice cultivation have resulted in an overall insufficient production of rice to meet the needs of Thailand's rice consumption. In addition to rice farming, coconut plantations also provide supplementary income to fishermen.

The coastal farming communities are located in the inner part of the Gulf of Thailand. These areas include the estuaries and deltas of four rivers - the Chao Phraya, Mae Klong, Nakhonchaisri, and Bang Prakong. The major occupations of these villages are salt farming, shrimp and fish farming, mariculture, and coconut plantation. This type of settlement is generally in a scattered pattern with each homestead on the farm land.

Most of the coastal urban and industrial communities are located in the vicinity of the inner Gulf of Thailand. Recently these provinces have been industrialized. For example, Chonburi province and neighboring Rayong and Chachoengsao have become the focus of the Eastern Seaboard development plan including a major new port, heavy industry zone, oil refineries, petrochemical industry, marine product industry and numerous housing estates, The rate of urbanization and industrialization in Chonburi and neighboring provinces is increasing rapidly (ONEB, 1986). In addition, many coastal provinces have rapidly developed due to the boom of tourism.

The migratory communities are mainly located in some of the southern provinces on the Bay of Bengal coast. They are an ethnic minority called "Chao Le" (sea dyak or sea gypsy). These people have no permanent settlement, wandering from place to place, from island to island, in order to find fishing locations, It is estimated that the population of sea dyaks in Thailand to be about 2,300 people or 400 households. They live in a small groups with a unique culture (Adulavidhaya, *et al.*, 1982).

#### 3.4 Environmental Degradation

There are numerous factors contributing to the environmental degradation and deterioration which have an impact directly and indirectly on the coasts. However, in sum, the following practices or circumstances are major contributors to environmental decline:

- Environmentally destructive practices
- Erosion, upland and coastal
- Sedimentation on coral and seagrass meadows
- Changes to salinity or freshwater regimes
- Water pollution, liquid and solid wastes
- Toxic chemicals from aquaculture run-off
- Mangrove removal, wood products and pond construction
- Over-exploitation of fish stocks
- Tin and sand mining or dredging
- Salt production
- Industry and power generation
- Obliteration of production habitat by unplanned development
- Urbanization

# 3.5 Land Use Conflicts

Land use problems in Thailand arise from competing, mutually exclusive uses for the same advantageously located piece of land. Coastal land is a prime example of this category: it is in demand as a desirable place to live, as a recreation resource, as a low-cost site for electrical power plants and industry, as a site for agriculture cultivation and plantation, and as tin mining and salt production area. Coastal land attracts commercial infrastructure as well as marine resources exploitation for mangrove products, aquaculture, mariculture and artisanal fishing. The complex overlap of land uses indicates that an integrated coastal zone management approach is necessary to resolve land use conflicts, and that it can aid in making resource allocation decisions for competing uses (McEachern, 1988).

# 4. SMALL-SCALE FISHERIES IN THAILAND

Small-scale fisheries are widely practised in the coastal area of Thailand because they can be operated by near-shore fishing, coastal aquaculture, and mariculture. Smallscale fishermen are important participants in the fishing industry of Thailand and account for three-quarters of the total number of fishermen. They provide one quarter of the total fish landings (DOF, 1987, Panayotou and Jetanavanich, 1987). Fishing is also an important source of rural employment and income. It is estimated that 5 percent of the total labour force in Southeast Asia depends on fishing for its livelihood (Panayotou, 1985). Panayotou, *et* al. (1985) also report that there are more than 300,000 small scale fishermen scattered along Thailand's coast.

Although there is no standard definition of small scale fisheries, various classifications of fisheries exist: small-scale versus large-scale; subsistence versus commercial; artisanal versus industrial; and inshore (or municipal) versus offshore. Fisheries may also be classified according to the vessel size; gear type and vessel size; distance from shore; or a combination of the three (Panayotou, 1985). It is not unusual to find that what is considered a small-scale fishery in one country would be classified as a large-scale fishery in another (Emmerson, 1980).

In Thailand, many institutions have attempted to define small scale fisheries. The following definitions used by 3 institutions are taken from Rientrairut (1985):

• Kasetsart University defines small-scale fisheries in terms of current value of fishing asset totaling less than 20,000 baht per fishing household.

- SEAFDEC defines small-scale in terms of fishing boats ranging from without boat, non-motorized boats, outboard motorized boats to inboard motorized boats less than 8 meters in length.
- DOF defines small-scale in terms of horsepower, length of boat, labour employed and type of fishing gear. All fisheries that are carried out using small traditional fishing gear, operating fishing on a subsistence basis as well as coastal aquaculture using small cultivation area; are defined as small-scale fisheries. Small fishing gear implies that the fishing gear used with the boats is not greater than 10 meters in length, and that the engine is not greater than 30 HP. Traditional fishing gear implies low efficiency and can be employed within the vicinity of a home base, or in the area close to the coast. Subsistence basis implies low income and fishing labour is mainly family members.

Generally, the income of small-scale fishermen in Thailand is composed of fishing income and non-fishing income. Fishing income is derived from three sources: own fishing, fishing labour and fish processing, whereas non-fishing income is derived from farming, hired labour and others (Rientrairut, 1985). Therefore, there is a wide difference in income among small-scale fishermen operating the same type of gear in different fishing grounds or different types of gear in the same fishing ground.

Unlike the commercial fisheries, the exact number of small-scale fishing boats in Thailand is unknown. Although commercial fishermen are required to register the boats and to obtain fishing gear licenses for the purposes of tax collection and inventory, small-scale fishermen are viewed as a poor group in the fishing industry. Their way of life is to fish on a subsistence basis using low-efficiency fishing gears which have a low impact on fishery resources. The government policy is to waive the tax for them, therefore some small-scale fishing gears are not required to obtain licenses (DOF, 1989). In addition, there are always some occupational and geographical migrations in and out of the fishing industry by small-scale fishermen (Panayotou and Panayotou, 1986). These reasons make it difficult to obtain an accurate accounting of small-scale fishing gears in Thailand.

Rientrairut (1985) suggests that there are 24 types of small-scale fishing gear in Thailand, numbering to about 45,000 units. Most of the gear are seasonal. Exceptions include shrimp gillnet, crab gillnet, push net and small beam trawl. The highest number of fishing gear is fish gillnet with about 5,700 units, followed by shrimp gillnet with about 5,200 units. Traditional fishing gear can be classified into four main groups: gillnet, longline, mobile gear and stationary gear (Table 1). Among them, mobile gear catches the highest percentage, approximately 40 percent of the total, whereas longline contributes the lowest at approximately 2 percent. Annual production of small-scale fisheries contributes about 20-30 percent of the total marine production and most of the catch is composed of high-value species.

<u>Gillnet</u>	<u>Mobile eear</u>
1. Swimming crab gillnet	17. Ark shell rake
2. Shrimp gillnet	18. Beam trawl
3. Fish gillnet	19. Acetes trawl
4. Seabass encircling gillnet	20. Push net
Stationarvgear	Long line
5. Squid trap	23. Hook
6. Fish trap	24. Squid hook line
7. Crab trap	
8. Circular net crab trap	
9. Bamboo mud crab trap	
10. Crab lift net	
11. Bamboo cylinder trap	
12. Small winged set bag	
13. Big block net	
14. Winged set bag	
15. Net for Malaya lift net	
16. Plotorus brush piles	

Table 1. List of small-scale fishing gear in Thailand.

Source: Rientrairut (1385).

In the past, the socio-economic problems faced by small-scale fishermen in Thailand were largely ignored. This was partly due to a presumption that, sooner or later, small-scale fishermen would be absorbed by the rapidly progressing large-scale fishing sector (either by acquiring advanced technology or by becoming labourers on large trawlers). The thinking was that they would be forced into alternative, more profitable, occupations. Aside from the social problems that such a transformation would have generated, the fact is that the small-scale fishermen, despite their apparently deteriorating standard of living, continue to exist alongside a highly profitable large-scale fishing sector. A number of explanations for this dualistic structure and persisting poverty have been advanced, ranging from the lack of advanced technology to the alleged exploitation by unscrupulous middlemen; and from the lack of alternative employment opportunities to fishermen's occupational and geographical immobility (Panayotou, et al., 1985, Rientrairut 1983).

Panayotou (1985) suggests that the Southeast Asian governments, including Thailand's are facing three distinct, but inter-dependent issues:

- how to attain a sustainable improvement in the socio-economic conditions of small-scale fishing communities;
- how to manage the resource so as to maximize its productivity (or, more appropriately, the net economic or net social benefit from the resource); and
- how to allocate the country's limited marine fisheries between small-scale fishing communities and commercial fisheries so as to minimize the conflict between them.

In order to solve these problems, many researchers, including Panayotou (1985), ADB (1985), and Rientrairut (1985) conclude that fisheries management can make a dual contribution towards the improvement of income levels of small-scale fishermen:

- by limiting entry into the coastal fishery, which would help consolidate possible gains from fishery development; and
- by effectively prohibiting the operation of the large-scale fishery (particularly trawlers) in the coastal waters, it would enlarge the effective resource base of the small-scale fishery.

# 5. POLICY OF THE DEPARTMENT OF FISHERIES REGARDING CBFM

In Thailand, the tremendous increase in the number of commercial fishing boats over the past three decades, from approximately 5,000 fishing vessels in the 1960's to approximately 20,000 fishing vessels in the 1980's and the 1990's (Nagalaksana, 1988; Panayotou and Jetanavanich, 1987; DOF, 1995) has **caused** the government fisheries agency to impose fishery regulations in order to minimize the impact of commercial fisheries on small-scale fisheries. This has been done by prohibiting trawl nets used with motorized fishing boats within 3,000 m of the shore (TDRI, 1987). In addition, this area is reserved as a spawning ground, nursery ground and feeding ground for many aquatic species.

There is a search for new management concepts and approaches for fisheries. One of the management concepts which has received much attention recently is the community-based fishery management system. The essence of such systems is that fishermen or fishermen's organizations, rather than the government, should be responsible for management and regulation of the fisheries. It is generally believed that if fishermen or fishermen's organizations were given management responsibilities, they would be more committed and responsive to management and conservation measures.

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Small-scale fishermen in Thailand are increasingly facing the problem of limited fishery resources, which has led to conflicts among resource users. In addition, many small-scale fishermen have improved their traditional fishing gear from simple stationary gear (such as trap, bamboo stake trap, bamboo cylinder trap, etc.) to more effective fishing gears (e.g., push net, small trawl net, etc.). The push net and small trawl net are operated nearshore, usually within an area of 3 km from the shore. Therefore, small-scale fishermen also violate the law and damage the fishery resources.

The Department of Fisheries has initiated and put forward the "Plan for Rehabilitating Thailand's Sea" to be considered at the national level early 1996. Later, the Prime Minister has agreed to adopt this plan as national policy. Under this plan, the sea will be divided into three zones: (i) nearshore within 3-5 km from the shore; (ii) offshore starting from 3-5 km from the shore up to 12 miles; and (iii) deep sea more than 12 miles from the shore. Fig. 1 shows the plan of DOF for zonation of fishery resources allocation in the sea.

The Department of Fisheries will introduce the fishing right system and the community-based coastal fisheries management system in the zone within 3-5 km from the shore. This area will provide an additional area for aquaculture, mariculture, and coastal fisheries for about 15 - 20 million rai based on the calculation of 2,500 miles of coastlines times 3-5 km seaward. A coastal population of up to 1 million live in this zone. In pursuance to this system, there are numerous activities to be initiated and implemented. These activities are briefly described below.

#### 5.1 Law Amendment

The existing fishery laws of Thailand are not comparable to the community based coastal fisheries management system. They do not contain provisions regarding the application of fishing right systems. Such provisions include the clarification of fishing right systems in Thailand; the establishment of fishing right systems by legislative power; the formation of fishermen's organizations (such as fishermen groups, fishermen associations or fishermen cooperatives); the role and duty of coastal communities regarding the management and conservation of coastal fishery resources; etc.

There is a need to amend the law in order that the Department of Fisheries could have a tool to manage coastal fishery resources effectively. The procedures of amending the law can be done either by adding the special chapter concerning community-based coastal fisheries management into the existing fisheries law or by amending the entire Fisheries Act.



Fig. 1. Zonation of fishery resources allocation in Thailand.

#### 5.2 Artificial Reefs and Other Facilities

The Department of Fisheries plans to support coastal communities by enhancing fishery resources in coastal areas. One way to do this has been by deploying artificial reefs throughout the coastal areas of the country. It is anticipated that such reefs will be constructed in the sea within a length of more than 1,000 km and a width extending to 2-3 km, Artificial reefs can serve as physical obstacles to trawlers and other commercial fishing boats. As well, artificial reefs help slow wave action, making some coastal areas suitable for aquaculture and mariculture. In addition, within the artificial reefs and vicinity, they provide a shelter for fish and other aquatic animals. These reefs also attract many aquatic species that have resulted in enhancing the productivity of the reefs. Between 1985 and 1995, the Department of Fisheries has constructed artificial reefs in 98 coastal areas within 290 square km of 22 coastal provinces.

In order to support community-based coastal fisheries management, many facilities will be provided by the Department of Fisheries as well. These facilities include small fishing ports, marine brake water constructions, cold storages, processing places, etc.

#### 5.3 Fishermen's Organization

The main theme of community-based coastal fisheries management is to establish fishermen's organizations – whether as fishermen's groups, fishermen's associations or fishermen's cooperatives. DOF in collaboration with other government agencies and local institutions will be responsible for this activity. Since government policy has focused on decentralization, government has given full support to this system. DOF will recommend incorporating the community-based coastal fisheries management plan into the Eight National Economic and Social Development Plan (1997-2001). In addition, DOF will amend the law in order that it contains a provision to form a fishermen's organization.

The fishery tax will be divided into two parts. One will be given to individuals and communities for use in their conservation and management programmes. Another will be returned to the central government as national revenue.

#### 5.4 Training Programme

DOF will provide training courses for coastal fishermen residing along the coasts. These training programs include fishing gear operation and maintenance, fishing boat operation and maintenance, fisheries laws and regulations, coastal fishery resources conservation and management, fishing rights system, and community-based fisheries management, etcetera. In addition, DOF also provides training courses for fishermen's family members such as children and women to be trained in fish processing technology, conservation of coastal resources and environment, among others.

Apart from providing a training program for coastal fishermen, there also will be the training program for fisheries officers of DOF to acquire the knowledge of fishing right systems and community-based coastal fisheries management. This is due to the fact that only a few of DOF's staff understand the concept and implementation of this system. In addition, many of DOF's staff should participate in international training programmes for community-based coastal fisheries management in countries with experience such as Japan.

#### 5.5 Pilot Project

DOF has recently initiated a plan for introducing a fishing rights system and community-based coastal fisheries management system in Thailand. Under this plan, there will be pilot projects to introduce fishing rights systems in some coastal fishing villages in southern provinces. Although DOF has constructed many artificial reefs and other facilities in many coastal areas, the fishing rights system has not yet been introduced due to lack of knowledge, experience, plan and regulation. DOF anticipates that the pilot project would help coastal communities, DOF's staff, and other people to gain some experiences in managing coastal fishery resources.

#### 6. CONCLUSION AND SUGGESTIONS

The Department of Fisheries views the coastal zone as an area for multiplicity of uses. Conflicts among resource users over environment protection, pollution, urban development and the utilization of other coastal resources including fishery resources have increased over time. In addition, the coastal areas are linked to the sea and affected by tides and the climate of the sea. Therefore, the management of coastal fishery resources should be integrated with marine fishery resources management. The Marine Fisheries Division and the Coastal Aquaculture Division of DOF will jointly plan and work closely in coastal areas of the country in the future, As well, community-based coastal fisheries management will be carried out by these two Divisions.

Regarding the FAO/BOBP project, DOF would suggest that the FAO/BOBP should look at land-based activities in the coastal areas as well, rather than focusing on sea activities. Therefore, FAO/BOBP should plan to increase support for projects involved in coastal area activities and in particular for community-based coastal fisheries management. The Department of Fisheries has recognized that community-based coastal fisheries management would be the right way to manage coastal fishery resources and will be given full support from the Thai government.

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