

**Fisheries Co-management:
An Experiential Account from Phang Nga Bay, Thailand**

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ABSTRACT

Like most other coastal water bodies around the world, this Thailand's largest bay on the Andaman seaboard has suffered the similar plights that have led to serious deterioration of coastal resources over the years. Despite its natural wealth derived from the fertile watershed and tropical climatic settings, Thailand's modern economic policies, began in 1960, have partly contributed to heavy exploitation, sometimes with destructive and indiscriminate fishing gears, resulting in a rapid decline in fish and invertebrate standing crops. Under the control of State, all fishing grounds are subject to legal measures issued primarily under the 1947 Fishery Act where fishery patrol workforce has confronted the persistent illegal fishers who have taken control by their sheer number. The government has also implemented the resource restoration measures, e.g. artificial reef placement, closed season, and closed area. The impacts on marine fisheries of marine shrimp farming that has occupied the increasing acreage along the fertile shoreline have been noted, as it closely links to other aquacultural practices, particularly those in and around the Bay.

Attempting to take control in this difficult game of number, Thailand adopted community-based fishery management in the 1960s with a design for people to control people. The 1947 Constitution has helped accelerated the administrative devolution and much of the centrally controlled measures have since 2003 come under the provincial administration, headed by the more powerful governor CEO. The speedier countermeasures against illegal fishing, by local communities and governor CEO, have proved to be effective, and Phang Nga Bay in the past two years can be said to recover—almost disappearance of destructive fishing, and reappearance of some fish species, e.g. *Hilsa*, certain dolphins, and dugong.

All these have paved a solid foundation for further co-management where all key stakeholders share decision-making and implementing their plans toward achieving their common goals. The 5-year Coastal Habitats and Coastal Resources Management (CHARM) project, co-funded by Royal Thai Government and the European Union has been devising and implementing this concept since November 2002, fortunately with some promising results.

Andaman Triangle Network, a recently established coastal resource conservation group comprising relevant government departments, NGOs, and community leaders, has been active in the three provinces bordering Phang Nga Bay. What the ATN has been advocating is the co-management approach, which is intended to replace the centrally management regime, the failure of which has been evidenced by the widespread deterioration of coastal resources.

Keywords: Co-management, Phang Nga Bay, Fishery resources, Small-scale fisheries

BACKGROUND

Fisheries sector has been important to Thailand in both economic and social aspects, and will continue to be so in years to come. By value, export fisheries commodities (79,138 million baht in 2005) ranks the third after manufactured and agricultural goods; and fish has long been staple in the Thai diet.

Increased fish production was spurred by marine capture fisheries that began in the 1960s resulting shortly after in widespread over-exploitation, not only the catch has tumbled and profit dissipated, the increased proportion of the lower quality “trash fish” has also made marine fisheries a serious problem area. Serious conflicts have intensified in the inshore fishing grounds, where fish stocks congregate, between the small-scale and commercial fishermen.

The management of fisheries of in Thailand could be traced back through the establishment of Department of Fisheries (DOF) itself. The DOF website (www.fisheries.go.th) provides an excellent detail in Thai (with a shorter version in English) that could be used to decipher some thoughts and actions behind the various legislations and fisheries management measures issued by the central authorities over times.

Although fisheries research that began in the 1960s has provided much scientific evidences for fisheries management; however, the core operations has remained in the hands of the central agencies (DOF, and Department of Marine and Coastal Resources—DMCR) that have relied fairly heavily on the legal measures provided by 1) the Navigation in the Thai Waters of 1913; 2) the Thai Vessels Act of 1938; 3) the Fishing Rights in the Thai Waters of 1939; 4) the Fisheries Law of 1947; 5) the Thai Harbor Authority Act of 1951; 6) the Fish Trading Act of 1953; 7) the National Park Act of 1961; and 8) the Wildlife Conservation and Protection Act of 1992. Relying heavily on the legal measures has made it difficult for most legal authorities to effect their operations as the overlapping powers vested in them by the laws could jeopardize their careers, not to mention any vested interest by influential parties in discouraging the legal enforcement. Unlike elsewhere in the world where policing and regulations are implemented for enforcing their exclusion policy (Scott, 2000), the legal enforcements in fisheries in Thailand have been based on the well-being of the fishstocks. Coupled with the predominance with natural scientists among administrators in DOF and DMCR, the rationale for the legal regulation is understood.

On the ground where life must go on, the conflicts among small-scale and commercial fishermen have evolved from the sheer competition for the resources: the former is largely for survival, and the latter for their economic benefits. As the question of property rights has not been taken up for a serious debate in Thailand, the quasi open-access regime continues to prevail.

Many attempts to address the users’ conflicts of the fisheries resources have centered on inshore fisheries where both small-scale and commercial fishermen concentrate their fishing efforts. The scarcity of fishery statistics made it impossible to understand whether and to which extent the transition has taken place among these two types of fishermen. Information on the reduction and increase of fishing boats is insufficient to explain who have gone out of the fishing business, and who are coming in for some particular reasons. It is only presumed that when fishing became unprofitable, small-scale fishermen may resort to alternative occupations, e.g. agriculture or livestock. The situation of commercial fishermen is much harder to understand as they comprise many parties with arrays of interest. While fishing crew may always be made available even if cheap foreign laborers have to be recruited, the boat owners and the entrepreneurs may find it more difficult to quit their business without a reasonable way to dispose off their capitals.

Fisheries policy makers have made it known that the serious problems exist; measures and policies have been outlined in order to address them, especially the conflicts among small-scale and commercial fisheries. It could be the reasons of lengthy legislative procedures that is required, or the short-term in office of fisheries administrators that have kept these planned measures and policies a mere rhetoric.

The Coastal Habitats and Resources Management (CHARM) Project is another attempt to address the fisheries and coastal problems mentioned in the foregoing. It is a 5-year Royal Thai Government's project, jointly funded by the European Union that was commissioned in November 2002. The CHARM's project areas are in the southern part of Thailand, covering four provinces on the Andaman Sea coast (Phang Nga, Phuket, Krabi, and Trang), and Surat Thani on eastern side of the peninsular opening to the Gulf of Thailand.

The purpose of this paper is to share with IIFET 2006 its empirical experiences in Phang Nga Bay, one of its work sites, to describe the transition of fisheries there, and the evidences of some initial success.

DESCRIPTION OF PHANG NGA BAY

Covering a maritime area of 3,600 sq.km, Phang Nga Bay is Thailand's largest bay on the Andaman Sea coast that connects the provinces of Phang Nga, Phuket, and Krabi. Several short rivers empty into the Bay largely passing through mangrove forests. Phang Nga Bay and its 67 islands are somewhat diversified: several natural habitats, coral reefs, seagrass beds and mangroves can be found (Korkiatwong *et al.*, 2005). The current in the Bay is dependent on the prevailing monsoons: it flows counterclockwise during the northeast monsoon regime, and clockwise under the influence of the southwest monsoon.

With a great diversification of fishery resource, as many as 80 species of pelagic fishes are found in the Bay, along with 240 more species of demersal fishes and shellfishes. This rich habitat has been shared by some endangered species that include sea mammals (Irawadee dolphin and dugong), and sea turtles (Limpasaichol, 2003). Since August 2002, Phang Nga Bay has been declared the 1185th Ramsar Site.

Like many other coastal areas in Thailand, the mangroves in Phang Nga Bay have dwindled as logging and clearance for shrimp farming have also taken place here. As many as six mangrove conservation stations have been active in the area; their locations: Tubpud, Takua Thung, Phuket, Klong Pon, Laem Sak, and Haad Noparat Thara.

THE PAST FISHERIES MANAGEMENT

General fisheries management scenarios

Like in many parts of the world, fisheries management in Thailand is a governmental system of management rules, based on defined objectives and a mix of management practices, aiming primarily to implement the rules. The major means of enforcing fishermen to comply with the rules is the monitoring, control, and surveillance (MCS). The rationale of fisheries management bases on biological arguments with the aim of protecting the biological resources in order to make sustainable exploitation possible.

With the strong economic and social objectives that have been consistently pursued by the National Economic and Social Development Plans since 1961, the political goal of resource use has been taken by Ministry of Agriculture and Cooperatives (MOAC) and Department of Fisheries (DOF) as the guide for their management of fisheries. Measures to maximize sustainable biomass yield (as guided by the annual increase of fish catch and volumes of export), to maximize sustainable economic yield (as guided by the increased values of the catch and export), to secure and increase employment in the fishing and its

downstream sectors (by means of allowing cheaper labor, largely immigrants to serve the fishing industry), to secure protein production and food supply (by assisting the fishing industries, e.g. in fuel subsidy, services of fish piers and landing facilities). The most important and unwavering political and social goals are to increase the export of fish and fish products.

The degradation of fishery resources has been known through research and monitoring efforts largely made by DOF. In recent years, the plights of small-scale fishermen have become a center of attention for assistance by the government and other agencies. Like the majority of people at the grassroots, the small-scale fishermen are presumably poor, and whatever they do to earn additional income can be claimed as a success. Small-scale fishermen have also been taken as the problematic group as they often involved in illegal fishing, and have been recognized as a hard group to educate owing to their poor formal educational background. Their large number has made the MCS operations extremely difficult, if not impossible, to cope with any violation of the prescribed fisheries management rules and regulations. In many locations, particularly in Phang Nga Bay, where small-scale fishermen have formed their groups to work side by side with the Fishery Patrol Units. Their main operational goal is to deter illegal fishing practices, e.g. trawling and push netting in the inshore areas, which they believe as a means of increasing fish biomass, and consequently of increasing their catch. Such the operations have been quite successful to clamp down illegal fishers who also live in the same or nearby communities; this is to say, the peer group pressure is yielding fruits. However, their frequent complains came from the powerful distant commercial fishing fleets, which frequently swoop in to haul the seemingly teeming inshore fish stocks, and destroyed stationary fishing gears (gillnets, fish or crab pots, and set bag nets) to the dismay of the small-scale fishermen's groups.

In four and a half decades since commercial fisheries have been wielding its power, little is known about them. Most research papers that have been generated by DOF (and now Department of Marine and Coastal Resources—DMCR, a new Department bifurcated from DOF) are largely in biological investigation. The seemingly lacking of interest in the commercial fisheries sector also stems from the fact that the majority of DOF and DMCR personnel are natural scientists whose professional interest is in the natural resources, and not in the matters concerning people or businesses. As a big business with some power, the sources of influence that the commercial fisheries has been wielding is relatively little known.

Fisheries management in Phang Nga Bay

A large number of biological evidences have shown that the status of marine living resources and their physical habitats in the Bay has been deteriorating. Its natural endowment, in terms of geographical settings and topography, tropical climatic conditions, great biological diversity, and richness fed to the Bay by various rivers and mangroves, have been viewed by different parties as a prime opportunity for exploitation. As most government agencies responsible for marine and coastal resources management have been paying attention to the state and the well-being of the resources, the exploitations whether in terms of fishing, tourism, mining, extracting of coral or ornamental fishes have been done with some liberty. Any illegal acts that have been subsequently coped by the law enforcing authorities have already damaged the resources, and whether or not the legal measures have been taken, it will take considerable time to rehabilitate.

Everyone believes that the dwindling aquatic resources in Phang Nga Bay are the results of the heavy and destructive fishing. More than 200 trawlers have been operating in the Bay; some with the net with 2.5 cm mesh size or even less. Experimental fishing carried out over the years by DOF scientists shows the catch per unit of effort (CPUE) tumbling from 160 kg/hr in 1969 to 38 kg/hr in 1993 with 66.7% as trash fish indicating improper use of resources. More than 290 small-scale fishermen have converted themselves into push netters as they have invested in larger gear and more powerful boats, yet the mesh sizes of their

net are still small. More than 80 “dwarf trawlers” fishing mainly for shrimp in the Bay; however, with small mesh size of their nets, their bycatch consists largely of trash fish.

In an attitude survey, carried out from March to October 2004, Panjarat *et al* (2005) based their findings on the sample of 100 fishermen in all six Andaman Sea provinces of Thailand that revealed the majority (59%) of commercial fishermen with negative attitudes toward fishery conservation measures. As many as 46% of small-scale fishermen in these provinces voiced their firm support to the conservation measures that have been carried out by the government and the communities.

To address the fisheries problem, DOF decided to introduce in 1978 the coastal aquaculture as a viable alternative and supplementary source of income to the socio-economic depressed communities in the Bay. In collaboration with FAO, UN and SIDA (Swedish International Development Authority), an area for of development in Phang Nga Bay was identified and formulated as the first action-oriented pilot project incorporating aquaculture demonstration together with a number of essential components of community based management and development activities (Bay of Bengal Programme for Development of Small-Scale Fisheries and South China Sea Fisheries Development and Coordinating Programme). The ultimate objective of the project was to improve the living standard of small-scale fishermen in depressed coastal fishing communities (BOBP, 1982).

The project area was located in the northern coast of the Bay, covering sixteen villages, of which six were selected as project sites. Most of their residents were small-scale fishermen. The average annual household income were below the national average, the decreasing financial return from fishing as well as the shortage of public facilities and infrastructures (fresh water supply, electricity etc.) had been a great concern to the government.

The site survey of potential aquaculture demonstration was undertaken for the purpose of identifying suitable locations and the status of the fisheries in the areas. The survey investigatory efforts were concentrated on commercial aquatic species their relative abundance in the coastal environment and the ecological aspects of the sites. From the survey it was confirmed that the suitable aquaculture activities were finfish cage culture (sea bass: *Lates calcarifer*; grouper: *Epinephelus coioides*), oyster culture (*Crassostrea* spp.), mussel culture (*Perna viridis*) and, horse mussel culture (*Modiolus senhousenii*) and cockle culture (*Anadara granosa*). There was also a benchmark survey undertaken on the socio-economic conditions.

The immediate objectives were to provide a viable alternative source of income or a supplementary source of income for small-scale fishermen and to develop a model for an expanded development effort in the rural fishing sector.

At the closing of the project in 1985, the shellfish culture was not as successful as others owing to the relatively higher cost of spat comparing to that of finfish fingerlings. Seven fishermen and three school groups in collaboration with Provincial Fisheries Office and also in close consultation within the village leaders were selected for demonstration of 26 cages in 1979, the launching phase of the project. In 1985, the numbers of cages had increased from ten to more than 3,000 cages by more than 1,000 fishermen (BOBP, 1986). Small cage fishermen who individually owned 5-30 cages did not expand this number due to problems of obtaining feed. However, they were still able to double their income from capture fisheries.

As cage aquaculture of carnivorous fishes needed feed, trash fish from destructive fishing immediately became the prime source. Development of pellet feed was still in its infancy at that time, and cage fish farmers found it essential to procure trash fish to keep their fish farms going. With the estimated demand

of 423 tonnes of trash fish a year, the practice of trawling, push netting and set bag netting had become essential to fish farming in the area.

THE INTERVENTION DURING CHARM PROJECT PERIOD

In 2004, the Provincial Governor, as provincial chief executive officer (CEO), has promoted banning of push and set bag netting in order to sustain the utilization of coastal natural resources. Coastal Habitats and Resources Management Project (CHARM), collaborated project between Government of Thailand and European Community, had taken action by encouraging those illegal-turned fishermen to divert to fish cage farmers. In the meantime, CHARM tried to solve the problem of large quantity of required feed by introducing artificial or pellet feed for substitution of trash fish. First trial on sea bass culture with pellet feed came out with good results, high yield at lower expense. This success would be a good demonstration of feasibility for farmers and, on the other hand, of the consequent ability of setting back the balance of coastal natural resources utilization.

The administrative devolution as prescribed by the 1997 Constitution was carried out actively by the government since 2003. As an outgrowth, provincial governors have been empowered, with more budget, greater financial flexibility, and the authority over any central level government officials working in the province. Emulating the model from business corporations where Chief Executive Officer is the key person for guiding and directing the business, the provincial governors have therefore been recognized as “Governor CEO”.

With the administrative power of the CEO, some provincial governors found it a good deal easier to administer the official assignment, particularly the coordination among government officials. In Phang Nga Bay, the Andaman Triangle Authority (ATA) that comprises Phuket, Phang Nga and Krabi provinces was evolved this way. The ATA that has set its collaborative goals on the promotion of tourism, improvement of infrastructure, promotion of high-end aquaculture, and conservation of marine and coastal resources, particularly in Phang Nga Bay. The MCS operations, which are the responsibility of both DOF and DMCR have been brought together, and their patrols have to be well coordinated.

It has been reported that the periods from 2004 to 2005 have seen far less destruction of the marine and coastal resources, particularly from destructive fishing. The number of commercial trawlers, and local push netters have gone behind the scene. In stating this, the authors are not implying the single factor that has made it so, the economic overfishing and various threats on the illegal operations from various corners may also be a possibility.

Effective deterrent methods to committing a crime have been given by Thikampornpong (2004), a CHARM short-term specialist. Measures that make the potential criminals to perceive as 1) more efforts have to be made; 2) more risks are involved; 3) undeserved booty; 4) no provocation; and 5) no accuse may be at work in this case.

CO-MANAGEMENT ARRANGEMENT

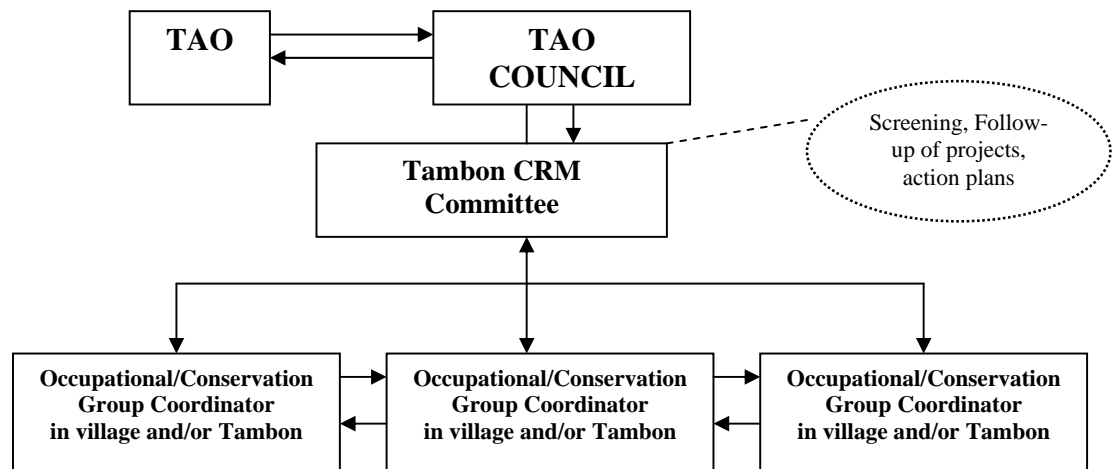
Essentially CHARM is designed around institutional development and capacity building with particular focus on the key stakeholders and beneficiaries at village and municipality (Tambon) community level. The core assumptions of appropriate and optimal coastal resources management are expected to be achieved through identified outcomes from 5 inter-related components (Henocque and Tandavanitj, 2006):

- Support mechanisms to the Royal Thai Government (RTG) participant agencies for policy-making, legislative adjustments and enforcement;
 - Development and effective support for co-management frameworks for all targeted communities and local authorities;
 - Enhanced human resources development;
 - Acquisition, management and dissemination of Coastal Resources Management (CRM) related information; and
 - Effective and efficient management of the recurrent project operations over its lifetime.
- Operational support facilitation is provided through the Project Management Unit in Bangkok and two Field Management Offices respectively located on the Andaman Sea (working for activities in Phang Nga Bay) and the Gulf of Thailand and comprised of directly recruited and seconded Department of Fisheries staff, complemented with international technical expertise.

CHARM and its partners, mostly NGOs, are currently working with community groups and local authorities in about 40 coastal sub-Districts or Tambon out of a total of 96 distributed in the 5 provinces (about 20 Tambon in 4 provinces are around Phang Nga Bay). Activities can be classified into four categories: conservation awareness raising, coastal resource management, extension and development of alternative livelihood and institutional development. With such an extension and a constant presence in the field, the project has gained the global positive image of a project that implements what it says through negotiation and “learning by doing” with the coastal communities. Co-management arrangement models and their enabling conditions are emerging and start to be replicated from Tambon to Tambon where (Fig. 1):

- A group may be an occupational or conservation group set up by villagers.
- Group coordinator means the person co-opted by all members in charge of coordinating within and between villages, including village development plan. To form the network, the coordinator might rely on the already existing civil society organizations as registered under the Tambon Administration Organization (TAO) National Act or appoint other additional persons to join the network. The coordinators’ team should be no more than 12-15 members.
- Tambon Coastal Resource Management Committee is teamed up with the 3 category groups selected and appointed by the TAO chief:
 - Representative(s) from village group coordinators as appropriate
 - Member(s) of TAO council in charge of natural resource and environment issues
 - Representative(s) from government agencies/organization related to Coastal Resource Management (CRM)
- The project may be directly in support to the TAO as follows:
 - Setting up organizational structure, budget allocation and necessary equipment
 - Training to strengthen staff capacity
 - Facilitating in CRM planning
 - Setting up the Tambon information center

For any proposed and approved activity, funds are either directly transferred to the group bank account or via the Tambon CRM Committee in case of pre-agreement with the groups involved and in order to strengthen coordination of activities at Tambon level.

Figure 1 - Co-management arrangement at Tambon level

MAIN ACHIEVEMENTS

Along the five co-management attributes defined by CHARM, the main achievements so far may be summarized as follows:

Participation – About 100 local demonstration projects have been identified, started and for some of them completed in the two project areas. The strategy has been as much as possible to distribute them in order to come up with a good coverage of the whole areas. Overall, 40 Tambon are concerned with a core of 26 Tambon in 17 Districts that the project is more particularly focusing. The Tsunami catastrophic impact has led the CHARM project to prepare and implement a Post-Tsunami Resources Allocation Plan addressing the whole Thai Andaman coast trying to turn out the disaster into an opportunity for alternative management approaches. Thanks to the setting up of a simplified procedure, a better assessment of demonstration project process and achievements could be made though their monitoring has still to be improved. In most of the Tambon, the institutional process for linking occupational groups with TAO planning activities has been initiated. Representation at provincial level has made some progress in at least two provinces. At larger scale, the Andaman Triangle Network (Phuket, Phang Nga, Krabi provinces) is taking off the ground in close collaboration with NGOs and local leaders from the three provinces.

Partnerships – While the partnership approach has been made as one of the fundamentals of the CHARM project, the most spectacular progress has been with NGOs in the tsunami aftermath and for a number of different activities. A partner network has been set up to exchange experiences and has them coordinating their activities when working in the same Tambon or sub-district. Meeting after meeting, the inter-department coordinators group has become more active with proposals, especially in the case of the Department of Marine and Coastal Resources with which the working relationship is now well established.

Integrated approaches and methods – One of the main achievements concern the vulnerability mapping tool, which has been developed through a large consultation amongst the academic and government sector

on one side and local users and authorities on the other side. The defined coastal units are becoming the spatial framework within which villages and Tambon common planning will be worked out with District and Provincial authorities. The on-going habitat monitoring activity will feed in each of the coastal unit concerned.

Learning and adaptation – In the context of the tsunami aftermath and the subsequent CHARM visibility enhancement, communication activities have been boosted through consultation workshops at inter-provincial level, participation of community representatives to international events held in Thailand, and information/communication products like the Coastal Resource Management curriculum developed for schools, the diving briefing cards for habitat monitoring from the diving sector, co-management guidebook, or video products on community achievements. In parallel and consequently to the context changes, the project logical framework has been first adapted after the tsunami and then following the Mid-Term Review recommendations.

Building capacity – An important training programme has followed the training needs assessment on community organization and strengthening, accounting, fishery Monitoring Control and Surveillance (MCS), and community-based tourism with a large participation of community groups/volunteers and local authorities representatives involving more than 500 people from the five provinces. Study tours and short-term training have been provided in collaboration with the Department of Fisheries, specialized NGOs or regional organizations like SEAFDEC or NACA.

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