CHAPTER SIX

FISHERIES: CAN THEY SURVIVE

"One throw of a net in the bay he would fill his boat with shrimp in only one hour."

An old villager said.

Boromthanarat, S., Cobb, S., Lee, V. (1991). Coastal Management in Pak Phanang: A Historical Perspective of the Resources and Issues. Hat Yai, Thailand: Coastal Resources Institute, Prince of Songkla University

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October 1, 2006

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Longtail boat with gill net for bay fishery.

Khun Seree is now a teacher in Pak Phanang, but he was a fisherman when he was young, about 35 years ago. Then, he remembers, one throw of a net in the bay would get a lot of fish. He could fill his boat with shrimp in only an hour. Now, the fish are fewer and smaller, and it takes a day to get a boatload of shrimp.

Khun Ruchatit, a prosperous businessman and Vice Chairman deputy chief of the Pak Phanang Chamber of Commerce, remarked that the offshore fishing industry also has fared poorly in recent years. At one time, Pak Phanang had more fishing boats than any other port in southern Thailand, he said. Now, the harbor has shoaled, and the boats go further out, and return to Songkhla or Pattani, not to Pak Phanang although many still belong to Pak Phanang owners.

There can be no doubt that the fisheries have declined since Khun Seree and Khun Ruchatit were young. Nevertheless, fishing was, and still is, a major source of food and prosperity, along with rice, since the area was settled long ago. There are two sources of fish: the Bay and the Gulf. The bay fisheries are carried out by many different types of gear, ranging from hand capture of crabs in the mangroves, through stationary gear in the shallow areas of the bay, to small boats using push-nets, gill nets, or trawls. Most of the Pak Phanang boats that fish in the Gulf are rigged for otter trawling to catch bottom fishes.

Shrimp catch using gill net.

THE OFFSHORE FISHERY

The Gulf of Thailand demersal fisheries are a classic case of overfishing. While the catch has remained relatively constant, it now takes many more fishing boats to harvest the catch. Figure 6.1 shows that the demersal (bottom-dwelling) fish catch from the Gulf increased nearly ten-fold between 1960 and 1970, but has remained relatively stable for the twenty years since. While the catch has remained relatively constant, Catch Per Unit Effort (CPUE) has declined sharply (Figure 6.2). Moreover, the proportion of food fish in the catch now is low: most of the increase has come in the form of low-value trash fish that are used for fish meal. The decrease in size of the catch and the lower value of the catch (Figure 6.3) coming from the Gulf has forced the trawlers to go farther from port, and make longer trips. Large trawlers have to travel more than 200 miles to fish the South China Sea. Fishermen say they have to go beyond Thailand's economic zone to find fish. In doing so, they risk arrest and impoundment of their boats. At present, about 20% of the fish catch of Thailand comes from international waters.

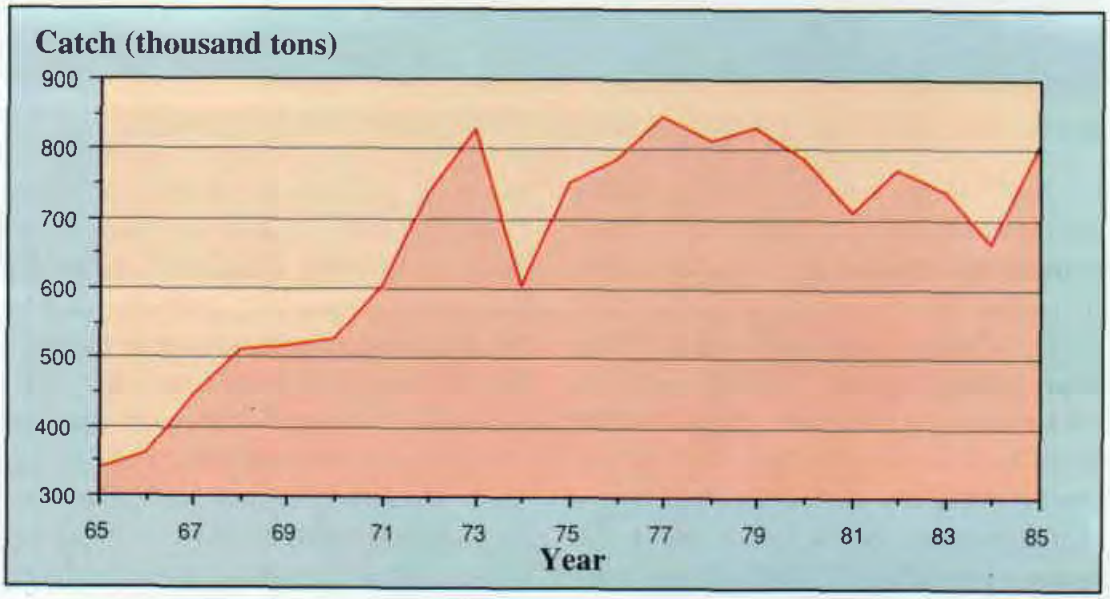


Figure 6.1.
Catch of demersal fish in the Gulf of Thailand from 1965 to 1985.

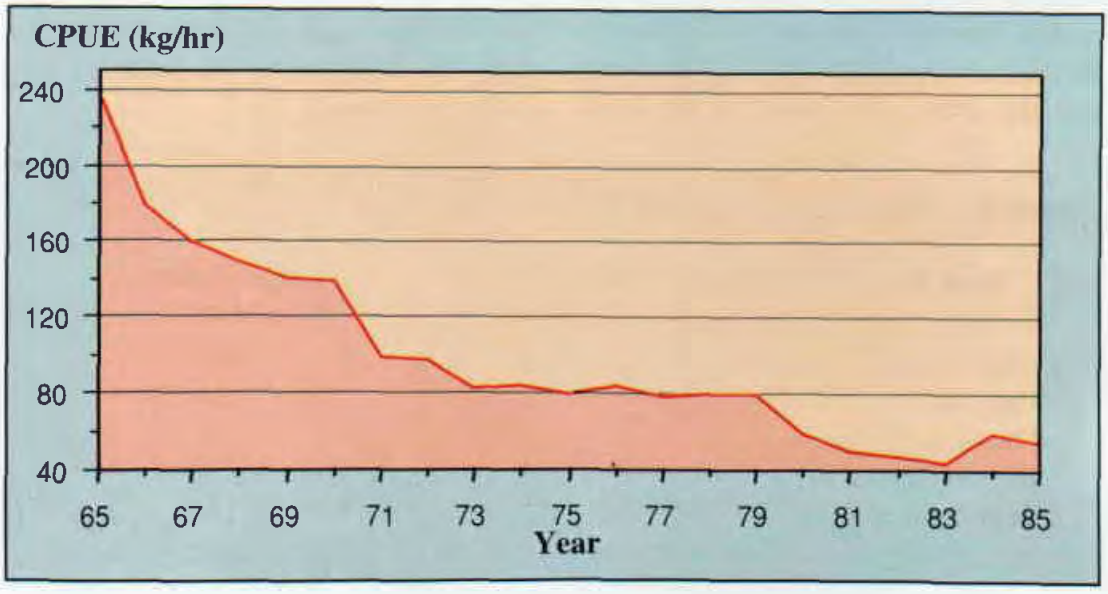


Figure 6.2.
Catch Per Unit Effort (CPUE) of the Gulf of Thailand demersal fishery from 1965 to 1985.

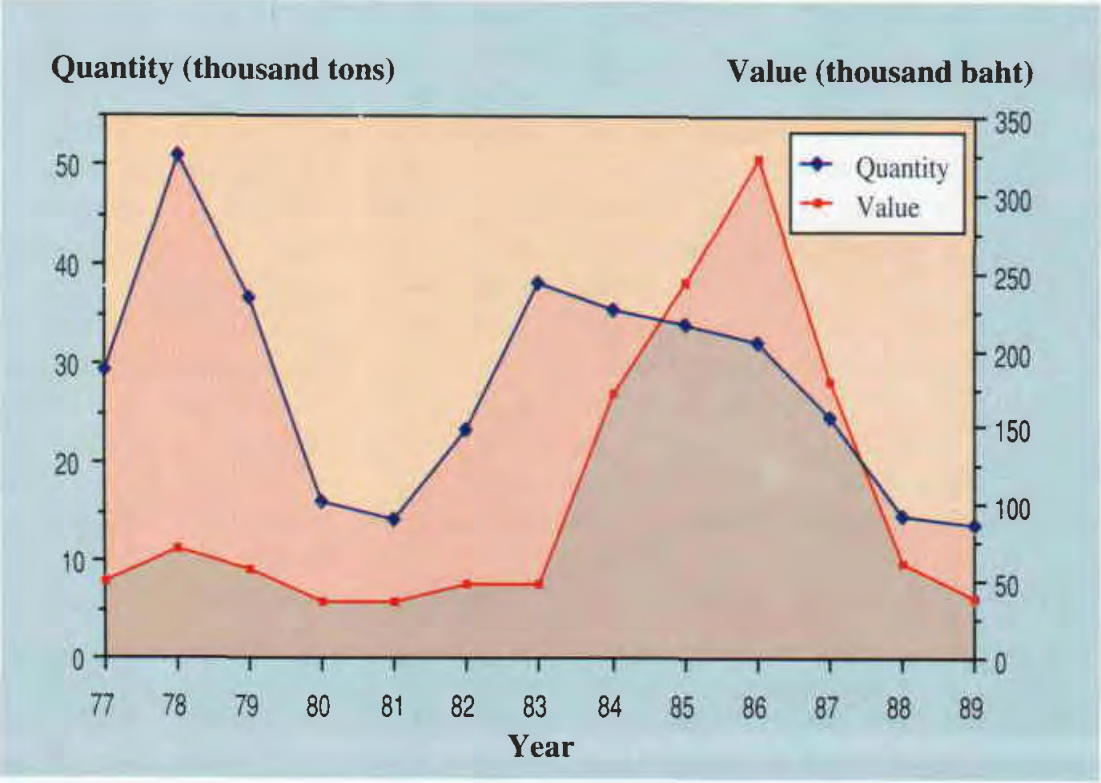


Figure 6.3. *Landings and value of fish landed at Pak Phanang, 1977-1989.*

In 1985, there were more than 1,500 fishing boats in Pak Phanang. Two-thirds of them were small boats that work mainly in the Bay or the nearby waters (see Table 6.1). Although there are many fishing boats based in Pak Phanang, most of the large ones do not come to Pak Phanang to off-load their catch. In a 1987 survey, the Fish Marketing Organization, found that approximately 50% of the boats larger than 14 m docked and sold their catch in Songkhla or Pattani. Thus, the profits from the fishing may accrue to the owners, who live in Pak Phanang, and the crew who work on the boats, but part of the economic benefit, including jobs, is lost to other ports. The reasons most frequently given for the move to Songkhla from the port at Pak Phanang are the shoaling of the Bay, which makes navigation difficult, the greater distance from port that the boats travel to reach the sea, and the lack of adequate port facilities in Pak Phanang. With the construction of the new fishing port facility, which opened in 1990, port facilities now are good. The boats have not returned, but there is hope that with the dredging of the channel, they will return soon.

Table 6.1. Pak Phanang Fishing Fleet in 1985.

Boat Type	*Small Boats <14 m*	*Large Boats >14 m*
Otter Trawler	366	541
Pair Trawler	0	54
Mackerel Gill Netter	0	5
Shrimp Gill Netter	286	0
Push-netter	306	0

THE BAY FISHERY

Many small-scale fishermen make their living from Pak Phanang Bay and the surrounding mangrove forests. An example of this is a small village in Khlong Noi, visited by a member of the CORIN team. In this village there are 521 families, of which 465 rely largely on fishing activities. Fifteen years ago there were 33 owners of push-net boats in the village, and there are more now. A typical push-net boat will catch 20 kg of shrimp in a night, along with about 80 kg of trash fish. Since the price of shrimp is about 40 baht per kg, and of trash fish is about 1 baht per kg, the gross income for a night's fishing may be 900 baht, of which 400 baht go to the expenses of running the boat.

Push-net boats had not always been common in Pak Phanang Bay. In the old days, Pak Phanang Bay was deeper, allowing purse seining for mackerel. Small purse seiners, introduced in about 1945, no longer fished the bay by the late 1960s, when it became too shallow to set their nets. Push-net boats came into their own shortly thereafter. An indication of the increased amount of smaller fishes in the catch was the appearance, in the mid-seventies, of the first fish meal factory, which processes exclusively trash fish. The stationary gear of the lift-net fishery appeared in about 1980, with yields of 10 kg in 1-2 hours. By 1990, these nets would only yield 2-5 kg per day. At the present time, a large number of types of fishing gear are used to harvest the multispecies fishery (Table 6.2). The most common species caught in the Bay are: penaeid shrimp (*Penaeus* and *Metapenaeus* spp.), mud crabs (*Scylla serrata*), striped sea catfish (*Plotosus canius*), bar-eyed goby (*Glossogobius giuris*), pointed-tail goby (*Apocryptodon lanceolatus*), mullet (*Mugil* spp.) and estuarine catfish (*Arius sagor*).

Lift net.

Estuarine catfish trap.

Push net.

Pointed-tail goby.

Estuarine catfish.

Table 6.2. Common Types of Fishing Gear Used in Pak Phanang Bay.

Gear Type	*Number*
Beam Trawl	387
Push Net	107
Shrimp Gill Net	382
Mullet Gill Net	62
Stationary Gears	
- Lift Net	236
- Fish Trap	33
- Stow Net	48
Hooks and Others	451

Before typhoon Harriet in 1962, we were told, Pak Phanang Bay was endowed with rich fishery resources. The gear used at that time mostly were simple and unmechanized stationary types such as stow traps and fish traps. The *"ghost boat"*, with an expanse of bamboo rib shaking in the water, caused the shrimp to jump into the boat; a fisherman could easily fill his boat in a day. Push nets have long been used in the Bay, but only as one-man operations, either by wading, or by hand-powered boats. Mechanized push-net boats were introduced in the 1960s, with motors of 6-10 horsepower. Their catch was 200-300 kg of shrimp per 6 hours of night-time fishing effort. After about 1972, the motor size was increased to 50-75 hp. Although the engine size increased, the shrimp catch dropped to 20-30 kg per night. Additionally, a number of species had disappeared from the catch. During the early days, shrimp comprised 10-15% of the catch, but now it is about 1% of the total. The small fishes that make up the rest of the catch are used as trash fish and sold to the fish meal factories. The same is true of the mud crab (*Scylla serrata*) fishery. The crab lift-net was once quite a dependable source of income, and almost 100% of the liftnets could be depended upon to catch crabs. Now, only 10-20% of the crab lift-nets can do so. Pointed-tail goby is a fish species that lives in holes on the mud flats, and that is commonly eaten by the residents of Pak Phanang. Previously, its abundance was so great that it could be caught easily with a handnet, but now the fish are captured using cyanide. Cyanide fishing is reputed to be one of the presumptive causes of decreased abundance of this fish species. The decline has been suggested to be the consequence of deforestation of mangrove areas surrounding the bay.

Crab lift net.

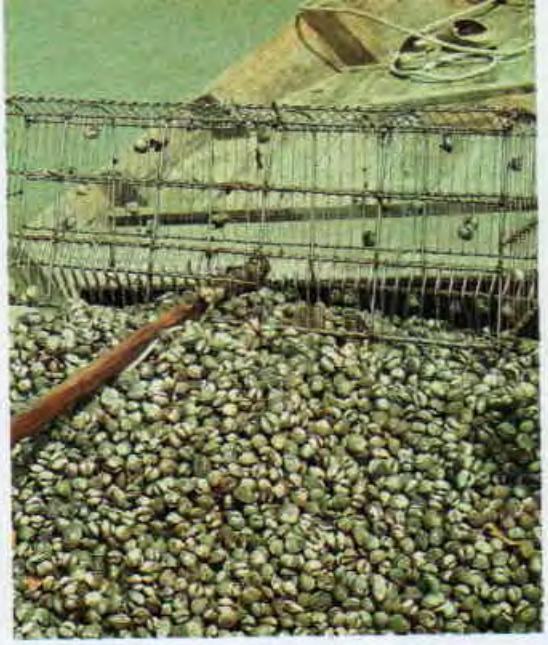
Ghost boat for traditional shrimp catch.

Small scale fishermen on Laem Talumpuk were, in 1979, among the poorest in Thailand according to a comparative study of the socioeconomics of small-scale fishing families. Their average household income was only 50% of the national average, and was 25% below the regional average. A major reason that these families were poor appeared to be that not only was the fishing not very lucrative, but there was little other opportunity for employment. This means that the opportunity costs of fishing were low, leading to a heavily exploited resource and a low catch per unit effort in the bay fishery. With the recent introduction of shrimp aquaculture, more employment opportunities have come to Laem Talumpak. As a result, its people have the highest family income of any town in the Pak Phanang district (Table 6.3).

Table 6.3. Average Income of Residents in Each Village of Pak Phanang District. Self-Earned Food is not Included as Income.

Village	*Baht/family/year*
Pak Phanang Municipality	12000
Laem Talumpuk	12500
East Pak Phanang	12000
Bang Pra	9500
Ban Peang	8000
Ta Praya	8000
Pak Praek	8500
Kha Nabnak	8500
West Pak Phanang	12000
Hulong	8500
Khlong Noi	11000
Khlong Kabue	11000
Ban Mai	9500
Bang Sala	8500
Chamao	12000
Ko Thuat	12000
Pa Rakam	12000
Bang Ta Pong	9800

Green mussel.



Cockle collection.

AQUACULTURE

In Pak Phanang Bay, there used to be an abundance of species and the potential for a large catch. After the typhoon in 1962 (which coincided with an increased fishing effort), residents have noted the loss of blood cockles, green mussels and oysters.

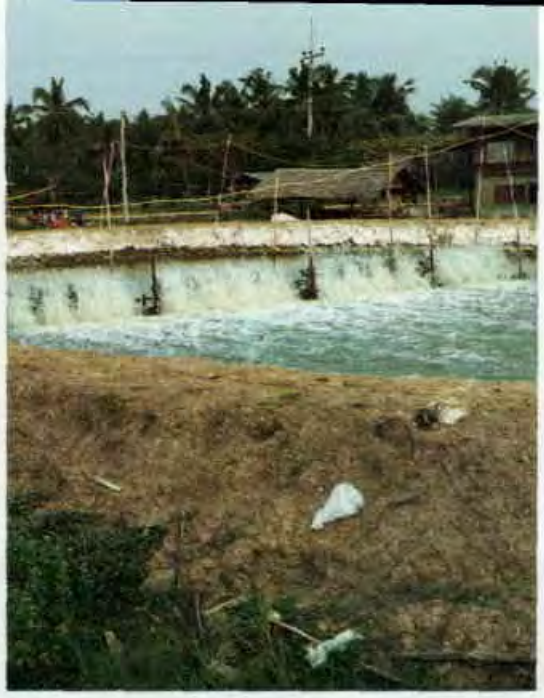
In response, the Royal Thai Fisheries Department supported the development of marine aquaculture in southern Thailand. Blood cockle spat was transplanted from Satun and Malaysia to the Pak Nakhon part of the Bay, and about 1,200 rai were experimental cockle farms, producing 3-6 tons per rai per year. Presently, the supply of spat is poor, and problems of robbery and freshwater inflow decrease the yield. Cage culture of sea bass was introduced in the bay in 1976, by the Fisheries Department. Grouper culture, mussel culture and oyster culture was initiated in 1978 and seaweed culture in 1989. The Green mussel, a much sought-after species also encountered problems of freshwater and poaching. Sea bass and grouper were raised in the inner part of the bay where the water was sufficiently deep to allow cage culture. And again, the problems of freshwater flow in the rainy season caused abandonment of this venture.

SHRIMP FARMING

Extensive shrimp farming, which uses large ponds and depends on natural seed from the bay, started in about 1957. At Pak Nakhon, 80-100 rai of ponds (production 50-250 kg/rai/yr) started in about 1957 in the mangrove areas along the coast of the west side of the bay. Research on higher density shrimp culture was started as early as 1971. Semi-intensive shrimp culture (ponds 10-30 rai; production 300-400 kg/rai/yr) began in the late seventies, and intensive culture (ponds 6-10 rai; production 1,500-2,000 kg/rai/yr) began in 1987. Since then, the number of shrimp farms, and shrimp farm owners, has increased dramatically (Figure 6.4). Massive mangrove deforestation took place to allow the shrimp farming at Pak Nakhon, Khlong Bang Chak and Tha Rai, and more recently from Khlong Noi to West Pak Phanang. Some ponds now also are found on the tip of Laem Talumpuk as well as in the mangrove areas of the spit.

Khun Manas has about 20 rai of shrimp ponds in West Pak Phanang, and he is proud of the way he and his brother manage them, and the profit they make. *"We don't stock at too high a density"*, he said, *"and we try to be careful of the environment." "We always plan to give the*

Extensive shrimp pond.



Intensive shrimp pond.

pond a rest once a year to let the sun take care of all the disease problems that might arise". Not all the shrimp farmers are as careful as Manas.

High stocking densities of juvenile shrimp can lead to enormous profits very quickly, as many of the independent shrimp farmers in the Pak Phanang area have learned. A major topic of conversation at the community workshop led by CORIN was the problems of shrimp, the pollution from the effluent of one entering another, the disease problems, what to do with the sludge and above all, the realization that many of the ponds are being overtaxed and will have a productive life of only 3 to 5 years. Khun Seree put it eloquently: *"people must turn to shrimp farming because of the economic incentives. But they also are beginning to realize that shrimp can eat your land."*

Right now, the shrimp business is booming in the coastal areas of Pak Phanang, and along the river. But on the west side of the bay, the ghosts of former shrimp ponds stand, mute testimony to Khun Seree's observation. Shrimp farmers on Laem Talumpuk only need to look across the Bay to see the future.

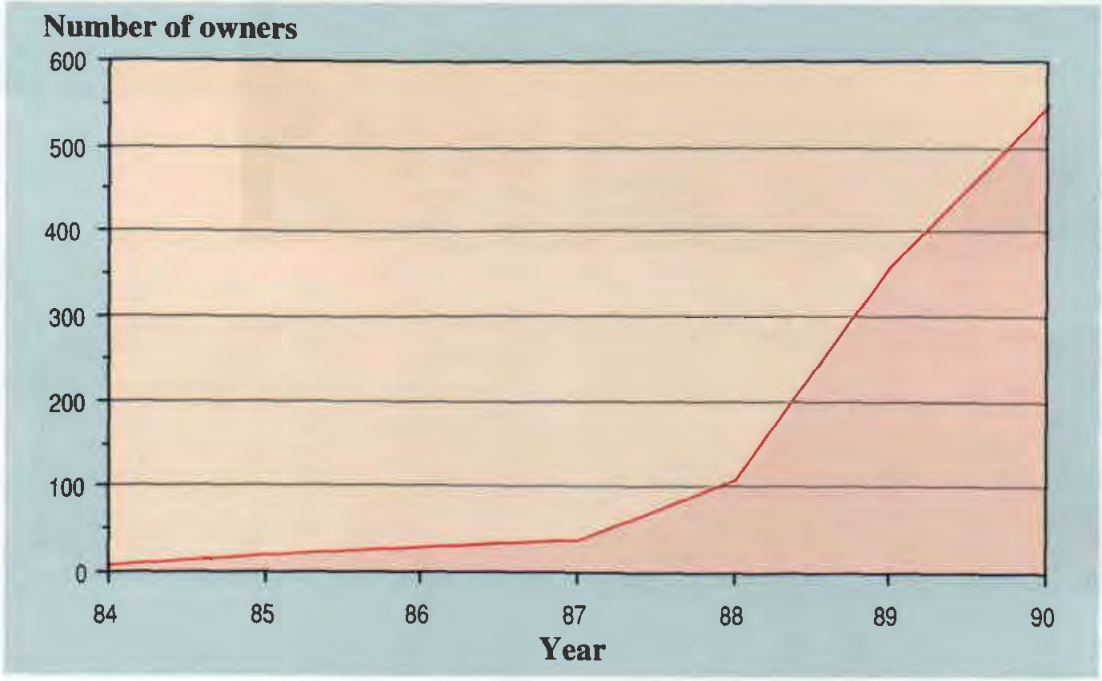


Figure 6.4.
Number of owners of shrimp farms in Pak Phanang, 1984-1990.