

# Community Mangrove Management in Pred Nai Village, Thailand

Jaruwan Kaewmahanin, Somsak Sukwong, Robert Fisher, and Supaporn Worraropnpan<sup>33</sup>

## Introduction

This case study describes forest management activities undertaken in a mangrove forest by the Pred Nai Community Forestry Group in Thailand. The village of Pred Nai is in Trat Province near the border of Cambodia. The mangrove is one of the last surviving mangrove forests on Thailand's eastern seaboard. The portion within Pred Nai covers 1,728 hectares (ha) (including 320 ha of plantation). Commercial logging since the 1940s has destroyed or degraded a significant area of mangrove forests in and near Pred Nai.

This case study discusses community action to restore the mangrove, beginning with attempts to prevent commercial logging for charcoal production. This was followed by the restoration of mangrove trees through plantations, as well as protection to allow regeneration. This evolved into active management of the mangroves to increase the production of aquatic species. Although the mangrove forest is technically under the authority of the Royal Forest Department, this has not prevented community action.

## Local-level institutional reforms for sustainable management

The community in Pred Nai is trying to ensure that the local mangrove forest is managed in a sustainable way. The degradation of the mangrove, an important habitat for aquatic animals (such as crabs), has affected the availability of these animals. Villagers also have perceived a reduction in coastal fisheries, which they consider to be due mainly to the degradation and destruction of mangrove forests.

Pred Nai was settled around the 1850s. Its current population is about 600 (170 households). The villagers' main occupation used to be rice cultivation.

They also harvested aquatic resources, such as crab, fish, and shellfish, as well as forest products as part of their livelihoods. Pred Nai's main economic activities now include running a rubber plantation, growing fruit gardens, cultivating shrimps, and fishing. Some villagers work as laborers. Landless villagers engage in fishery activities and work as laborers.

The mangrove forest was placed under a logging concession in 1941. By 1985, villagers became concerned that the logging concessionaires were overharvesting the mangrove and prohibiting villagers from harvesting crabs, shellfish, fish, and other products in the concession areas. Some local people converted degraded mangrove areas into shrimp farms and built a gate to block seawater, which further damaged the mangrove's ecology. In 1986, the villagers formed a group to stop logging and shrimp farming. Their efforts were successful; commercial logging ceased in 1987, the company was ousted from the village (the concession was legally terminated in 2000), and the seawater gate was destroyed.

Even after the concessions stopped, it was difficult to prevent outsiders from nearby villages and farther away from harvesting or destroying resources within the mangrove area. Nervous about any harvesting, local leaders prohibited harvesting in a conservation area that comprised a small part of the mangrove. Harvesting regulations for the grapsoid crab (*Metopograpsus* sp.)—a small crab harvested for sale and rarely consumed by the collectors—were developed in 1997. These regulations involved closing the harvest during the breeding period in October.

A forest management group for the mangrove was formed in 1998. Its activities included resource mapping and forest patrols. Drawing on the strengths of local traditions and village elders, Pred Nai villagers built on some of the organizational and institutional skills developed as a result of a village savings fund started in 1995, with the support of a respected monk. First, the villagers planted trees in the denuded mangrove area; some stands began to regenerate naturally under strict village protection. Second, villagers set out to increase the production of mud crab (*Scylla serrata*)—another economically

<sup>33</sup>This paper is based on experiences gained in an action research project carried out in Pred Nai, Thailand, in collaboration with the community and funded by the Toyota Foundation. We wish to thank the people of Pred Nai for their cooperation and enthusiasm. We also wish to thank Jim Enright for help in providing the scientific names of marine species and for advice on mangrove ecology.

The paper is an expanded and revised version of a paper originally prepared for distribution at the World Parks Congress, Durban, 8–17 September 2003 and subsequently published as: Jaruwan Kaewmahanin, Somsak Sukwong, and R.J. Fisher. 2005. Pred Nai Community Forest, Trat Province, Thailand. Case Study No. 1 in R.J. Fisher, Stewart Maginnis, W.J. Jackson, Edmund Barrow, and Sally Jeanrenaud, *Poverty and Conservation: Landscapes, People, and Power*. Gland, Switzerland and Cambridge, UK: IUCN The World Conservation Union.

important aquatic animal—by starting a “crab bank.” People who caught egg-bearing crabs were asked to place them in one of the cages established by the management group in the canals.

A more detailed mangrove management planning exercise began with the technical support of the Regional Community Forestry Training Center for Asia and the Pacific (RECOFTC) from 2000.

The villagers also acted to prevent destructive fishing practices. In addition, they are experimenting with thinning the dense natural stands of *Cerriops*. The villagers exchange ideas with fishery researchers to help with the monitoring methods and the collection of relevant data. The process and results are analyzed and reflected in the subsequent planning cycle. This conscious learning process is an important aspect of the group’s success.

The villagers realized that the people of a single community could not implement successful and sustainable forest management because boundaries were not demarcated and there were no regulations on forest use. A mangrove network was developed with some other local villages. The network was first initiated and facilitated in villages sharing boundaries with Pred Nai and later expanded to many other villages. The communities all became members of the Community Coastal Resource Management Network, Trat Province. Through the exchange of knowledge and experiences, the villagers have learned from their successes and failures. Their collaboration has allowed them to initiate new ideas and practices that respond to community needs.<sup>34</sup>

The movement to regain control of the mangroves was initiated by residents of Pred Nai who sought support from some local politicians. Subsequently, in 1998, RECOFTC was invited to provide technical support, especially for management planning. This was formalized and increased in 2000 through a small support project funded by the Toyota Foundation. The activity began as and remained a local initiative. Table 19 presents a chronological summary of the landmark dates in the Pred Nai story.

## Ecosystem improvements

The project began with the restoration of the mangrove forest through plantations and protection,

**Table 19: Chronology of Events at Pred Nai**

Year	Event
1985	Villagers become concerned about the impacts of the mangrove logging concession
1986	Group formed to stop logging and shrimp farming
1987	Logging stopped
1995	Savings management group formed
1997	Grapsoid crab harvesting regulations
1998	Forest management group started RECOFTC support requested Mangrove management activities started
2000	RECOFTC involvement increases with Toyota Foundation Project Formalizing of Community Coastal Resource Management Network, Trat Province

RECOFTC = Regional Community Forestry Training Centre for Asia and the Pacific.

leading to the regeneration of mangrove trees. After 16 years of community action, fauna biodiversity has increased. Villagers report that stocks of crab, shellfish, and fish have grown also. Many water birds, such as the painted stork (*Mycteria leucocephala*), *Parphyris poliocephalus*, purple heron (*Ardea purpurea*), grey heron (*Ardea cineria*), lesser whistling duck (*Dendrocygna javanica*), and brahminy kite (*Haliastur indus*) are returning. Moreover, macaques (*Macaca fascicularis*) reportedly have come back after moving away during the logging period. *Hoy lod* or razor clams (*Solen strictus* Gould) that were absent for 20 years also have reappeared.

After a couple of years of protection and some conflicts over the use of forest resources, villagers are trying more proactive management methods, emphasizing sustainable use rather than more passive conservation.

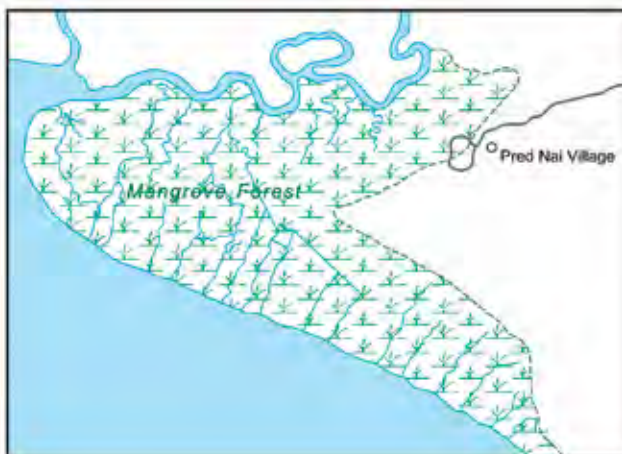
One of the most valuable local species is the mud crab, which is rare because so few mangroves remain. Some villagers who were interested in cultivating the mud crab formed a group to increase production. In addition to exchanging ideas among themselves, they are in contact with fishery researchers who specialize in crab aquarium breeding.

In conservation literature, a debate over whether sustainable use and biodiversity conservation are

<sup>34</sup>A film in Thai and English has been produced about this networking activity: A Community Coastal Resource Management Network in Trat Province, the Regional Community Forestry Training Centre for Asia and the Pacific (RECOFTC), 2002. Pred Nai also appears in the film: Forests, Local Knowledge and Livelihoods, IFAD/RECOFTC, 2000.

Map 11

### Location Map of Pred Nai



- Mangrove Forest
  - National Capital
  - Provincial Capital
  - District Capital
  - Village
  - Main Road
  - Village Road
  - River
  - Village Boundary
  - District Boundary
  - Provincial Boundary
  - International Boundary
- Boundaries are not necessarily authoritative

compatible continues (see, for example, Robinson, 1999). In Pred Nai—and no doubt in many other cases of community-based conservation—previous use had undermined biodiversity severely. However, community-based initiatives have led to increased income and improved biodiversity, and community activity did not so much “conserve” biodiversity as reintroduce it.

In terms of biodiversity, the mangrove is now much healthier and biologically diverse. Apart from more aquatic animals and mangrove tree species, some aquatic animals and mangrove tree, bird, and mammal species have returned to the site. Also, while outcomes in biodiversity terms might not be perfect, they represent a major improvement. Third, in terms of the role of government policies, the original degradation was not the result of poor community practices. Rather, it was the consequence of government-issued logging concessions and the policy of promoting shrimp farming.

## Poverty reduction

By Thai standards, Pred Nai village is not a particularly poor village. Livelihood and income sources are varied, and include horticultural activities and fishing. The connections between mangrove use, harvesting, and poverty are not simple because several categories of the poor can be found. Since each category has different types of assets and livelihood strategies, they are likely to be affected differently by changes to mangrove management.

The village has a significant number of relatively poor people, usually landless. Mangrove management has reduced poverty in their case and is likely to lead to improved livelihood security for other members of the community, especially those involved in fishing. Landless people can be subdivided into crab collectors and wage laborers who work in rubber gardens, shrimp farms, or in Trat town.

Some of the people in debt as a result of bankruptcy from shrimp farming or other causes might own land. For those within this group interested in crab collecting and fishing, better mangrove management has improved food security and provided alternative work.

The mangrove ecosystem is a valuable source of income for some villagers, and is the basis of a way of life for the village as a whole. The management initiative has helped ensure that the environmentally and economically important mangrove area is managed in a sustainable way. Improvements in the con-

dition of the mangrove have increased the availability of aquatic animals, especially crabs that are collected and sold. Mainly poorer members of the community, especially those without land, collect crabs. They obtain significant income from this activity, and income levels have improved.

After a few years of monitoring, the average daily harvest of grapsoid crab apparently has increased from 8 to 15 kilogram (kg) per collector per day. Significantly, the time spent collecting crabs has decreased—meaning collectors have more time for other income-generating activities—thereby increasing overall income and spreading risk across more activities.

Since the introduction of crab banks, an increase in mud crab harvests also has been reported. As Table 20 shows, the income, the number of collectors, and the quantity of aquatic animals harvested from the community mangrove forest are increasing.

With the improved catches of grapsoid crab, the income level of crab-collecting villagers has almost doubled. While exact figures on income from crab collection are not available, data suggests that the poorer villagers engaged in crab collection could earn 500–600 baht (B) (\$12–\$13) per day. An increase in mud crab harvests resulting from the innovative introduction of crab banks also has been reported. Artificial fish “houses” made from blocks of used car tires are being installed in canals within the mangrove. Villagers and outsiders said this reduces the time needed for fish harvesting.

Local management efforts also have spurred other community development activities. In addition to activities within the mangroves, Pred Nai villagers are trying to restore the seacoast within a 3,000-meter conservation zone and protect it from destructive fishing practices, such as the use of push nets and trawlers. A community patrol is enforcing the regulation against push nets with local government support. The success of the community forestry activities has encouraged the villagers to develop a marketing system, and a women’s group has been processing crackers made from mangrove plants and producing local wine for sale.

The savings management group formed in 1995 has more than 600 members, and a fund of about B6 million (about \$150,000). Other community groups were established, such as a women’s group, a youth group, and the network of people from various villages who use the mangrove area. The management initiative also has encouraged other villages to set up community forests.

**Table 20: Harvest of Aquatic Animals and Income, 1998–2003**

Type	1998	2003
Grapsoid crab	8 kg/day at B50/kg = B400/day	15 kg/day at B40/kg = B600/day
	6 collectors involved	30 collectors involved
Mud crab	B10,000/season (3 months) per cultivator <sup>a</sup> family	B15,000/season per cultivator family
	6 cultivator families	10 cultivator families
Clams	5 kg/day at B25/kg	6 kg/day at B30/kg
	5 collectors	10 collectors

Notes: Data collected in early 2004.

Exchange rate in December 2004: US\$1 = approximately 40 baht (B); kg = kilogram.

<sup>a</sup>The term “cultivator” is used because mud crabs are raised in ponds.

Thus, restoration and management activities have improved significantly livelihood security, especially for the poorer segment of the population. However, the impact on poverty in Pred Nai has not been just in terms of income generation,<sup>35</sup> but also in the sense of empowerment (e.g., increased capability for organization). The confidence people gained from successes, such as the savings fund and earlier mangrove conservation, helped build a sort of organizational confidence or social capital.

### Gender matters

An important aspect of any attempts to deal with conservation, livelihood security, or poverty reduction is the equitable distribution of the costs and benefits of activities across groups within a society. This includes aspects relating to gender. This study has shown that improved livelihood security and incomes for relatively poor people were the main benefits of improved mangrove management at Pred Nai. These people did not appear to incur any major costs, nor were any groups harmed by the activities.

In terms of gender, the direct beneficiaries of the improved production of marine animals have been the collectors (all male) and, presumably, their families. There is no evidence that women have borne any additional costs as a result of the conservation activities. The only local trader collecting and

processing grapsoid crabs is a woman. From a gender perspective, an interesting aspect of the developments in Pred Nai is that women have been active participants in the Forest Management Committee (the current chairperson is a woman), as well as in the savings group.

### Other benefits

The success of community action has had spin-offs in terms of increased confidence to engage in other activities, including the savings fund and, increasingly, ecotourism. Some additional benefits seem to have accrued in terms of health as increased income and work opportunities apparently have contributed to a reduction in drug consumption, although this has not been quantified.

Education is another important factor. The local school has been involved in management, and educational activities revolve around the mangrove. Villagers have collaborated with the schools, with some elders teaching school children about mangrove ecology and coastal resources. The mangrove community forest has served as a learning laboratory. Boys and girls have joined adult villagers in the planting program and the forest thinning experiment. The villagers also have constructed a walkway in the mangrove for educational purposes, which also could have potential for ecotourism. The Asia-Pacific Economic Cooperation (APEC)

<sup>35</sup>The multidimensional nature of poverty must be understood. According to the World Bank (2000), poverty is concerned with lack of assets, powerlessness, and vulnerability.

sponsored a group of school children from various countries to attend an environmental camp and carry out fieldwork at Pred Nai in July 2003. The students learned about mangrove and coastal resources, generating a sense of pride in Pred Nai.

The link with education is especially important because a self-taught approach has been a major factor in the success of Pred Nai. The villagers started with reflection, and then developed their abilities to solve problems, learning new ways to manage the resources, their village, and their own lives. Expanding and institutionalizing this through the younger generation is a logical development of this approach.

### **Networking, external support, and partnerships**

The success of the initiative depended on managing the mangrove area, as well as the people who use the mangrove. The project incorporated innovative partnerships and a wide range of participants.

After the mangrove concessions ended and the management group was set up, local users who depended on the area were not allowed to harvest any products. This caused resentment and conflicts. After discussions with community members, however, the villagers slowly began experimenting with less restrictive management and the committee became more inclusive.

Partnerships needed to be established with people from other villages who wished to use the resources. Villagers set up the Community Coastal Resource Management Network, which meets in different villages on a rotating basis. The development of the network demonstrated the recognition that managing mangroves at the site level alone is difficult without the cooperation of nearby communities.

The study has pointed out that this activity was based on a community initiative. However, the community asked RECOFTC to provide technical support and facilitation. RECOFTC primarily supported the community by facilitating forest management planning activities, and assisting with the formalization of the wider network of villages interested in mangrove conservation. The network, a local initiative, was initially more informal.

Technical support was provided through collaboration with government officials (fisheries and forests) and academics from regional universities. Villagers have gained experience by collaborating with outsiders, such as fishery experts, foresters, and

various institutions. Since some problems are beyond the scope of village action, links with other institutions are important. These include networks with other villages, collaboration with other institutions (e.g., government forestry and fishery departments), police patrols, and politicians. Religious institutions, such as temples in the Eastern Gulf region, also have been important partners.

The other main participants are local officials. Although the Government of Thailand does not legally recognize local management efforts, local officials have supported them, and have provided technical and moral support. The provincial governor became an active supporter of the community forest and the mangrove network after seeing what local efforts had achieved. An important lesson is that legal recognition is not essential if there is a collective interest and vision in managing resources.

### **Institutional sustainability**

Because the initiative operates at the local level, the learning capacity of community members has increased. Villagers also learned to communicate and collaborate with outsiders. In the early days of community action, villagers contacted the ministerial level of government for help; when other problems arose within the community or nearby, they initiated local solutions. That achievements can be traced largely to initiatives and decision making from within the community bodes well for sustainability.

The villagers' success has become so well-known that many study tours from abroad have come to visit. Ecotourism also is being discussed. Both of these outcomes have potential benefits and risks. One of the risks (or costs) is the time involved in managing so many visitors. On the other hand, the visitors act as an incentive to pursue conservation efforts.

Within the village, some conflicts have arisen between conservation and resource utilization objectives. At one stage, the committee's focus on conservation came into conflict with people who wanted to use the mangrove resources as livelihood assets. The current committee chairperson is committed to sustainable use rather than narrow conservation.

Pred Nai is a good example of innovation in natural resource management, and in using savings for village development. The forest, as well as the broader landscape (including the sea, canals, and orchards), is managed, conserved, and sustained. Local efforts will be sustained as long as there are economic, envi-

ronmental, and cultural interests in managing the mangrove area. A potential threat to the initiative is restrictive and intrusive national legislation that usurps the rights and efforts of the local villagers in the name of the “national interest.”

### Political and legislative context

Pred Nai has received fairly wide recognition as an exemplary community initiative. In 2001, an NGO presented the community with the Green Globe Award, and the Royal Forest Department awarded a prize to Pred Nai Community Forest in 2002. In 2004, it was one of the 30 communities globally recognized by the Equator Initiative. The recognition by the Royal Forest Department (now part of the Ministry of Environment) is particularly ironic given that legislative support for local forest management efforts has been debated for more than a decade in Thailand. On the surface, the ingredients for cooperative management are in place. Communities throughout Thailand are managing and protecting forests and the constitution which operated from 1997 until the coup of September 2006 stipulated that local communities have the right to participate in natural resource management. Upon closer inspection, however, many obstacles remain.

The policy reform process has stagnated, and conflicts are becoming more acute. Local networks of community forestry groups are pitted against a powerful coalition of bureaucrats, academics, and environmentalists who perceive rural people as destructive and consider their participation a threat to national interests. For many years there has been debate about a Community Forestry Bill, with a number of versions being prepared in turn. People’s organizations and their supporters submitted a ‘community-friendly’ version to Parliament in March 2000 after collecting 52,698 signatures. A parliamentary commission was set up to examine the bill and previous community forestry bills. However, the commission was canceled after only 3 months when Parliament was dissolved.

In response, a mass media campaign was initiated to lobby for changes to parliamentary regulations and more inclusive parliamentary commissions. After the new Government was elected, a new commission was set up. It included 13 people’s representatives, who made up one third of the members. The commission finalized the drafted bill, which the lower house of Parliament then approved.

However, the upper house (Senate) changed the bill’s intent and focus drastically. The crucial part of the bill, Article 18, states that people settled in national parks, wildlife sanctuaries, and watersheds before the forests were declared protected could continue to manage and use forest products in a sustainable way. The Senate deleted this provision for various reasons. Some senators said they were afraid that if the villagers received rights to manage the forest, they would convert the fertile forest to grow cash crops; others were afraid that “outsiders” might abuse the bill by encroaching on protected forest, and then claim the right to manage it. Further discussions occurred, but the process has been stalled since the constitutional crisis which has led to Thailand being ruled by a caretaker government since early 2006.

### Conclusion

Community-based initiatives in general, and Pred Nai in particular, should not be romanticized. Within Pred Nai, differences of opinion and conflict have arisen regarding mangrove management, including a debate about conservation versus sustainable use. What is important is that the community members have managed the conflicts themselves through negotiation and dialogue. Pred Nai shows that communities can work cooperatively, and that community initiatives can improve biodiversity. Although biodiversity had been compromised, largely as a result of outside commercial interests and government policies, it has improved immensely since the villagers regained control. Pred Nai is an example of people empowering themselves through local initiative and organization, demonstrating that confidence can be gained through small successes and that community action can help improve livelihood and reduce poverty.

## Wetland Resource Management in Bangladesh to Improve Livelihoods and Sustain Natural Resources

*Aimun Nishat, Md Rakibul Haque, S.M. Munjurul Hannan Khan, Rashiduzzaman Ahmed, and Raquibul Amin*

### Introduction

Wetlands are invaluable ecosystems in Bangladesh, supporting up to 100 million people. People get food, fuel, fiber, fodder, house-building materials, etc. from