

# Responsible Blood Cockle Fisheries Management in Petchaburi Province, Thailand: An Ecosystem Approach to Fisheries Management

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In Thailand, blood cockle (*Anadara granosa*) is a popular species exploited for its economic value. As reported by FAO, the consumption by the Thais of this species far exceeded local production. In order to address the high demand for blood cockle, the Government of Thailand on one hand chiefly imported blood cockle seeds from Malaysia, and on the other hand, the Department of Fisheries of Thailand has been promoting the culture of blood cockle in many coastal provinces of the Gulf of Thailand. Considering that blood cockles are economically valuable, the commercial and small-scale fishers heavily exploit this commodity, and as a result its production had rapidly declined accordingly.

The lessons learned and experience gained (Fig. 1) from the small-scale fishers of Ban Bang Khunsai Village, Bang Khunsai Sub-district, Ban Laem District, Petchaburi Province (Fig. 2) on blood cockle fisheries management provides insights on the process and responsible practice of fisheries management as well as on local fishers' participation in the management, an example of a cohesive practice of ecosystem approach to fisheries management. In addition, it should also be noted that such practice and the local fishers' participation in management has been coherent with creating sustainable livelihoods and promoting integrated management towards sustainable fisheries (FAO, 2010). In terms of livelihood sustainability, the local fishers were able to earn income by collecting blood cockles and selling the produce to markets. Additionally, local fishers practice integrated management approach by conserving the mangrove forests and conducting surveillance on irresponsible fishing practiced in the area.



Fig. 2. Map of Bang Khunsai Village, Bang Khunsai Sub-district, Ban Laem District, Petchaburi Province

## Valuable Lessons Learned

Ban Bang Khunsai Village is located along the coast of the Gulf of Thailand and has mangrove forests as important local ecosystem. The mangrove forests provide various services such as ecological service to both animals and aquatic resources. The forests also potentially provide flora for local resident to exploit for subsistence and other marketable products (Alongi, 2002). A local resident cited that he and other villagers depended mainly on mangrove forests and aquatic resources to generate income for their households.

During the last two decades, the local residents exploited the aquatic resources and deforested the mangroves without care of what will happen in the future (Fig. 3). Moreover, a local resident also mentioned that fishers with cockle dredgers as well as hand collecting fishers compete to exploit the cockle resource to earn income. Consequently, the degraded mangrove forests led to decline of the aquatic resources particularly the blood cockle, seriously affecting the local residents. While the mangrove forests continued to decline, the blood cockle and other aquatic species were becoming scarce. There was no doubt that the local residents also lost their source of income and were confronted with hardships with no means of livelihood. When the blood cockle resource had deteriorated due to irresponsible and competitive exploitation, many local residents left the village and moved to work in urban areas.

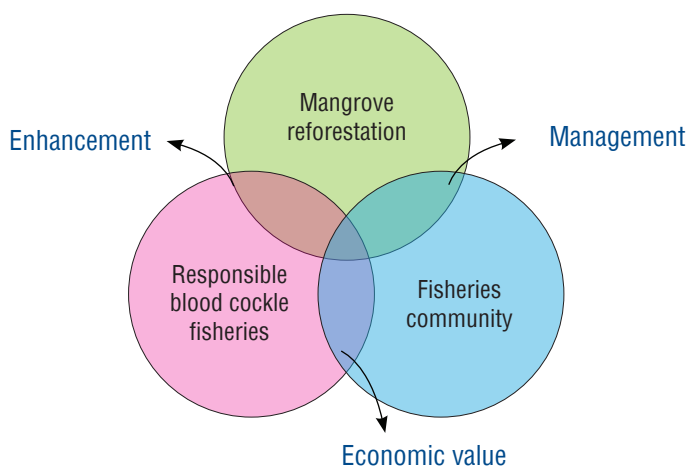


Fig. 1. Lessons learned and experience gained on cohesive interaction in responsible blood cockle fisheries management



Fig. 3. Deterioration of mangrove forest in Ban Bang Khunsai Village due to irresponsible exploitation

nursing grounds of many aquatic resources. Additionally, re-plantation of the forests would also enhance the habitats of the aquatic resources therefore, supporting the very vital link of the mangrove resources with the resources that sustain capture fisheries and aquaculture production (Rönnbäck, 1999). Specifically in muddy areas next to mangrove forests, abundant blood cockle resource could be found (Fig. 5). In order to strengthen the management of the species, the local residents formed a blood cockle conservative group in 1994. The group designated the areas for cockle conservation, covering about 27 km<sup>2</sup>. Recently, the group has more than one hundred members.

## Management and Surveillance

The members of the blood cockle conservative group revealed that attention is paid and efforts are exerted to safeguard the designated cockle conservation areas for enhancing new recruitment of the species. Moreover, the provincial and district government offices provided support to the group to enable them to execute their activities. In this connection, the group has established their own regulations to protect the cockles from irresponsible harvesting. The first regulation is cockle size restriction where local residents are not allowed to catch the size of cockle which is smaller than 2.6 cm, and the second is to prohibit the operation of illegal fishing gear in the designated cockle fishing grounds. In order to implement the second regulation, the group has set up a surveillance unit to monitor any illegal fishing operations and encroachment into the conservation areas.

Accordingly, the society and economy of the village had collapsed. Most heads of families left for the city to work while many young local residents also moved to urban areas to find work. The women, children and elderly people remained in the village during that time, making the village society became vulnerable. In addition, the low purchasing power of local residents led to low dynamic of the village economy.



### Eligible management

Upon recognizing the impacts of the declining mangrove forests that resulted in the slack of the social and economic development of the village, the remaining residents decided to put initial focus on reforestation of the mangrove forests to enhance the ecological services that the forests could ultimately provide them. After receiving support from nearby Mangrove Forest Station Office, the villagers organized mangrove reforestation and conservation activities with the objective of sustaining the forests as source of natural capital and to revitalize the once rich aquatic resource (Fig. 4).



Fig. 4. Mangrove reforestation

The villagers were aware that the forest areas are credible and vigorous source of food, and serve as spawning and





Fig. 5. Blood cockle fishing ground in Ban Bang Khunsai Village

The surveillance unit monitors with a tentative schedule but implements the regulation by seizing the fishing boat and corresponding gear found to have encroached in the said areas. All seized properties are kept in a community storing plant called boat cemetery (Fig. 6). Arrested fishers are sent to court and in most cases are required to pay a fine before redeeming their fishing equipments. If the arrested fishers could not comply with the requirements, the group would sell all seized fishing assets out and the money obtained would be used to defray the operating costs of the group. Moreover, in order that the group's surveillance unit could seriously conduct monitoring of the cockle areas, the Bang Khunsai Sub-district Administrative Organization allocated a budget of Thai Baht 100,000 to the group for fuel expenses in their surveillance activity.



Fig. 6. The village boat cemetery

## Revitalize Livelihood and Better Society

In the mangrove and blood cockle conservation areas, the group's regulations and surveillance are significantly carried out, and as a consequence the cockle resource had continued to improve. A local resident stated that there are now one thousand blood cockle collectors including those coming from adjacent villages and generate income from blood cockle collection. One blood cockle collector declared that he had been collecting cockles by hand for more than 30 years. He said that his fishing equipments for collecting the bivalves include boat, mud-ski board, plastic box, and plastic bag (Fig. 7).

When tide is low at daytime, a cockle collector goes to the cockle fishing ground at 0700 or 0800 hrs and return to shore at 1400 hrs. Additionally, when tide is low at night-time, he leaves the shore at 1900 hrs and come back to shore at 0300 or 0400 hrs of the next day. During the peak fishing season, a cockle collector could earn income of Thai Baht 500-700 per trip while off fishing season, a collector could get an income of Thai Baht 100-200 per trip. Recently, the price of blood cockle is Baht 15-16 per kg (interview in August 2010, US\$ 1.0 = Baht 30.0).

The minimum income of Thai Baht 100-200 per trip is equivalent to US\$ 3.33-6.67, so that blood cockle collectors



Fig. 7. Blood cockle collection and equipments used in the operation

can earn income higher than the poverty line defined in Thailand, which is lower than US\$ 2.0 per day. This indicates that the collectors can secure their purchasing power to contribute to the economic development of the village. The abundance of blood cockle does not only lead to the development of the village economy, but also improves the village society considering that many local residents who moved out have returned to the village to engage in cockle fisheries. These local residents are the important manpower who could fundamentally drive the village economy and at the same time maintain their culture and society.

## Precaution and Security

Competition in collecting blood cockles is not only among the small-scale shellfish collectors but also with fishers operating the cockle dredge fishing boats. The latter stakeholders have higher potentials and efforts in terms of fishing gear, technology and labor to exploit the bivalves than the former. A public relation officer of the blood cockle conservation group remarkably pointed out that the local users collect blood cockle by hand in one hour and accordingly, they earn income of Baht 50. However, a blood cockle dredge operation could earn an income of Baht 5,000-10,000. This is major reason for the prohibition of dredge operation in coastal areas of the village 3 km from the shoreline. Nowadays, the use of scoops for collecting the bivalves had been illegally used. To prevent this latest fishing gear operation, the surveillance unit and other group members are altruistically monitoring the use of scoops in the cockle conservation areas. Nevertheless, the villagers also recognized the fact that the blood cockles could be abundant or scarce in accordance with their natural fertilization rate, so that if the natural fertilization is low consequently, the blood cockle resource could severely decrease.

## Conclusion

Responsible blood cockle fisheries management implemented by the local residents of Ban Bang Khunsai Village has provided good lessons and experience for tangibly practicing the ecosystem approach to fisheries. Both integrated management and sustainable livelihood approaches were definitely handled by local residents through their active participation in the resource management. Such integrated management could be seen from the people's participation in mangrove reforestation in order to secure the natural capital and maintain the ecological services that sustain production from capture fisheries. The amount of income derived from cockle collection and the increasing number of bivalve collectors employed could be indications on how the

local residents react to such accessible and sustainable livelihood. Based on such experience therefore, the local residents have more reasons to protect their social rights to access the bivalve resources from commercial fishing boats by setting and implementing the regulations by the blood cockle conservation group. Meanwhile, the regulation limiting the size of bivalves to be harvested coupled with the designation of the conservation area are effective applications to promote rights-based fisheries for sustainable development. Nevertheless, the promotion of social rights and rights-based fisheries in fisheries community strongly needs legitimate policies for proper application in the fisheries communities.

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