SOCIO-ECONOMIC IMPACTS OF SHRIMP AQUACULTURE AT KUALA SELANGOR MALAYSIA

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ABSTRACT

Shrimp farming has been carried out extensively along the coastal areas of Bagan Tengkorak, Tanjung Karang, Selangor, Malaysia. Large areas of mangroves in the area, almost 90% had been cleared for the development of shrimp farming. The closest human settlement to the shrimp ponds are the people of Bagan Tengkorak. A case study was conducted at Bagan Tengkorak to assess the socio-economic and environmental impacts due to the development of shrimp farms in the area. The study group in this case are the people who make a living from the nearby mangrove forests before the shrimp farm development and until now. Result of the study showed that the tiger prawn farming along the coastal areas, did not bring any positive effects to the people of Bagan Tengkorak. The entrepreneurs with their foreign capital cleared and changed mangrove forest and wetland landscape into rows of ponds along the coast. The residents of Bagan Tengkorak did not benefit from shrimp farm development including any job opportunity or aquaculture products from the ponds for trade or consumption. There is no significant infrastructure development or existing infra-structure maintenance taking place in the area due to the development of shrimp farms. Rather, the shrimp farm development along the coast of Bagan Tengkorak has brought many environmental and socio-economic problems including loss of mangrove forest, coastal wildlife habitats, loss of natural resources, frequent flooding, loss of income, reduced fish catch and pest problems.

Keywords: Shrimp aquaculture, socio-economic impacts, environmental impact
INTRODUCTION

Most of the socio-economic activity in the district of Kuala Selangor revolves around agricultural activities including rice paddy plantations, vegetable farming, fishery, forestry, oil palm, cocoa and rubber plantations. According to Department of Statistic Malaysia (1991), 32.5 percent of the total labour force in the district of Kuala Selangor is involved in agriculture, as compared to 7.4 percent for the whole Selangor state. This case study was carried out as part of an intensive and extensive study that was carried out to assess the environmental impact of tiger prawn farming along the coast area of Bagan Tengkorak in the district of Kuala Selangor, Selangor, Malaysia.

STUDY AREA

The tiger prawn aquaculture farms in Bagan Tengkorak are located 15 km from Bandar Kuala Selangor, Selangor and from 80 km Kuala Lumpur, at Latitude 101°06’45”E, 3°28’15”N to 101°10’30”E, 3°23’40”N, and between Sungai Tengi up to Sungai Mandur Wahid (Figure 1). The size of the farms in Bagan Tengkorak area ranged from 10 to 155 acres and in operation for the past 20 years and used semi-intensive farming method. The surrounding land use consists mainly of oil palm, paddy, coconut and orchards plantations.
Figure 1: Location of Bagan Tengkorak Area in the State of Selangor, Malaysia.
RESEARCH METHODOLOGY

The case study on the impact of tiger prawn farming on the local community and the surrounding environment was carried out through primary and secondary data collection and observations in Bagan Tengkorak area. The primary data was obtained through field work and interviews with local communities. This study was carried out to assess and record accurately and vividly the people’s perception, opinion and experiences on socio-economic and environmental impacts before and after establishment of shrimp farms. Interviews were conducted to gather specific information and views about the background and perception of the surrounding people of the tiger prawn farms including benefits gained, socio-economic and environmental impacts, and local communities reaction towards the shrimp farm activities, etc. An exclusive interview was conducted with four respondents as a case study to obtain specific information on the elderly population that is working or making a living from the nearby mangroves before and after the shrimp farms development. The purpose was to obtain information on the issues and problems facing the local population due to shrimp farms development in the area. The interview was conducted between January to February 2001 with Mr. Suhaime Bin Sapuan (farmer), Mr. Awang Mat Deris (fisherman), Haji Jamhari Bin Tok Cik (fisherman) dan Mrs. Mayah Bt. Nayan (clams and shell collector).
RESULT AND DISCUSSION

The results from the study showed that the respondents were only recently realized and correlated the existence of shrimp farm after experiencing the detrimental socio-economic and environmental effects especially after direct loss of their livelihood. The respondents namely Mr. Suhaimi, Mr. Awang, Haji Jamhari and Mrs. Mayah explained that they know about the shrimp farm development but did not know of their socio-econimic and environmental impacts. They start giving attention to the shrimp farms for the past three years, after realizing some direct impact on their livelihood. They realized that more than 300 acres of mangroves have been cleared for the shrimp farms development. The respondent stated that the tiger prawn farms were run by entrepreuners from far away from the districts, with investment from China and Taiwan, while all the workers consists mainly of foreign labourers from Thailand and Indonesia. Not a single village resident are involved in the farming activity or gained any direct economic benefit. The most prevalent problems faced by the villagers of Bagan Tengorak were frequent flood as a result of shrimp ponds development. In 2000 alone the village was flooded twice.

The mangrove forest which remained as a buffer between sea and the village has been cleared causing tidal waters intrusion to the drains and waterways in the village which in turn caused frequent floods. The man-made coastal bund which divides the coast and agriculture lands from tidal water and saline intrusion was frequently damaged by unabated tidal waves due to loss of mangrove buffer, which in turn caused frequent flooding especially in low lying areas of banana and coconut plantations. Salt
water intrusion to the agriculture areas also destroyed the crops and plantations. The villagers complained about the reduced harvest due to the floods and saline intrusion. The floods do not only destroy crops but also damaged their household belongings. This was mainly due to loss of the mangrove forests, which acted as primary flood prevention and erosion control natural vegetative buffer all along the coastal areas. The coastal mangrove forests which naturally retained excessive flood waters and tidal water including the surface runoff and river overflow during the mansoon seasons. This estuarine mangrove reduced the volume of flood waters running down from the upstream rivers. The importance of mangrove to prevent coastal flood was proven in other studies as well. (Primavera, 1991; Burbridge, 1994; Paw & Chua, 1988). However, this function of the mangrove forest was lost in Bagan Tengorak area due to its clearance for shrimp farms.

The clearing of mangrove forest along the coast of Bagan Tengkorak caused loss of important wildlife habitats. Mangrove forests play an important role for coastal wildlife including as major breeding grounds for coastal fisheries. (Bailey, 1988; Field, 1981; Rutzler & Feller, 1996). There are many wildlife endemic to mangrove forests and are dependent on these forests for their survival. (Hutchings, 1981). Monkeys are the worst affected wildlife and lost its natural habitats and food sources. Due to the loss of their habitats in mangrove areas, the monkeys have migrated to urban and village areas including the banana and coconut plantations. The monkeys are not only eat their crops but also destroyed the young coconut fruits and buds. The villagers incurred heavy losses due to the consistent damages caused by the migrated monkeys from mangrove forest. According to Mrs. Mayah, before the mangrove forests were cleared,
the villagers can harvest up to 1000 coconuts, but now the number has dropped to 600. The monkeys had invaded the villagers’ houses and ruined the household items apart from stealing their food. According to Mr. Awang, he had to use the recycled fishing net around the household items to keep the monkeys out of their household items. The villagers had to wrap the bananas and other natural food items with used fishing nets to avoid monkey being stealing them.

The villagers also complained of lack of seafood and other natural products from the mangrove and mudflat areas which were abundant before the development of shrimp farms. The villagers could make a living from collecting siput sedut, lala, cockles, crabs, mudskippers and fish from the mangrove forest. The villagers harvested mangrove plants as a food source such as *Acrostichum sureum* (piai) where the stem is used vegetable, *Avicennia officinalis* (api-api ludat) where the fruit is boiled and eaten and *Brugueira sexangula* (berus) where the leaves and stem are used vegetables. The clearing of the mangroves has deprived the villagers of the seafood and crops from the mangrove. Mrs. Mayah who has been collecting siput sedut for a long time says that her yield from collecting siput sedut has decreased. According to her, she used to collect an average of 10 kg per day, which reduced to 4 - 5 kg per day after establishment of shrimp farms. The number of siputs is declining due to their habitats loss as a result of shrimp farm cultivation. Bailey (1988) also reported the same results and it his opinion that local communities dependent on coastal natural products are commonly isolated in the economy. Bann (1998) and Munro (1993) explained that the loss of coastal products due to the change in land use from mangrove forests to aquaculture and the natural
coastal resources which were common property has become private property, to the point that the locals has lost access to the coast to make a living.

The results of other studies supports this views such as the study by Roggeri (1995) at five villages in Songkhram Valley, Mekong River, Thailand, where the villagers were dependent on the mangrove resources. This socio-economic study showed that the villager got 60of their main source of protein from the mangrove forests around Huai Nam U, Thailand. In Malaysia, the coastal and river community got their food such as fishes, crabs, prawns, cockles, and even herbal medicines from the mangrove forest. Leaves, stems, fruits, and seeds are among the main resources used everyday. For example, the leaves of *Rhizophora sp.* can be eaten as a vegetable, while; the nuts from the *Avicennia alba* can be broiled and eaten. Study by Phan & Hoang (1993) in Vietnam, showed that local community is marginalized in Dong Rui, Tien Yen regional, Hoang Tan,Yen Hung and also in Vinh Thuc Island, Vietnam. Local community not only depends to natural resources from the mangrove forest but also used the mangrove forest as their settlement areas.

In the current study, the 70 years old Mr. Awang, who works as a fisherman since small, informed that his catch was declining significantly. According to him, the catch today is not as bountiful as before, and has been declining by about 20 – 30 percent due to the clearing of the mangrove forests. Additionally, the fisherman now a days have to use engine boats to go further out to sea to get more fishes as the coastal areas are no longer abundant with fishes. Several other studies concur to these results. Bann (2002) in Cambodia and Perez-Sanchez & Muir (2003) found that aquaculture
activities do not increase the income of fishermen, but actually reduces the catch. There are many species of fishes and aquatic life that inhabit the mangrove forest for at least part of their life cycle (Semesi 1998). A study by Chong et al. (1998) which was carried out in the Straits of Klang and Angsa Island showed a positive correlation between large numbers of fishes with the total areas of mangroves. Research showed that the waters around mangrove trees are important breeding grounds for fishes and other marine aquatic life. Intensive reclamation of mangroves for the development of Kuala Selangor urban areas as well as aquaculture activities reduced the potential of mangroves as breeding grounds for coastal fisheries. Many other researchers including Primavera (1991) in the Phillipines, Aksornkoae (1978) in Thailand and Purwito & Nurzali (1977) in Indonesia showed positive correlation between mangroves and prawn landings.

Before the development of shrimp farms, the local villagers were able to use natural resources from the mangroves to fulfill their daily needs. Mrs. Mayah said that previously, she could use firewood from the nearby mangrove forests. Now, there are no more wood that can be used as fuel. The villagers also used nipah leaves from the mangrove to make their roofs in the 1970’s but now the use of nipah leaves was decreasing. The nipah leaves were used to make the roofs of fowl-houses and sheds. Nowadays, nipah leaves are hard to come by and alternatives are explored or purchased to make roofs. The mangroves forests provide resources that are the main source of income for the locals. It provides food (fish, deer, birds, and vegetables), building materials (bamboo, straw, and timber), fuel for cooking and for other economic commodities such as smoking rubber, burning bricks and medicines (Semesi, 1998; Phan and Hoang, 1993; Aksornkoae, 1985; Boonnitee, 1978; Sukristijono 1979; Dixon
1989). In South East Asia such as Thailand, Malaysia and Indonesia, the coastal community has manipulated the mangrove to fulfill their daily needs and additional income (IPT-Asian Wetland Bureau, 1994). The mangrove forests are the main source of food, medicines, fuel, as well as construction materials (Chansang et al. 1982; Jara, 1985).

Loss of the mangroves to shrimp farms development has also caused the local population to lose their recreational spot. Before the mangrove was cleared, the villagers used to do their recreational activities in the forest, such as attracting birds, bird watching and fishing. The villagers also use the forest products to make souvenirs such as mats and household items. Nowadays, the villagers are no longer able to attract birds. In fact, the villagers have also lost their source of materials for making souvenirs. The villagers have lost the green and serene scenery of a forest that was their recreational area in their free time. The mangroves are an important part of recreation, culture, and tourism as it provides natural aesthetic beauty for activities such as watching fireflies, fishing, bird watching and attracting birds (Soepadmo, 1985; Dingwall, 1984).

Although the villagers bore many problems from the development of the shrimp farm projects in the coastal area of Bagan Tengkorak, the villagers have not made many complaints. Most of the villagers do not know whom to make complain or report. They are disappointed that development that was done in their area is not only giving them any benefit, but it is actually having a detrimental effect on them in terms of losses due to floods, reduced crop production, monkey attacks, loss of income as well as loss of their recreational area. Their reaction is only voiced out to the Head of Village (Tok
Sidang) and Village Committee. However, no follow up action has been taken any time. Only when there was flooding in the area, the local authorities would take some remedial measures.

CONCLUSION

Villagers have lost their natural resources due to the clearing of the mangrove forests along the coast of Bagan Tenglorak for shrimp farms. The mangrove clearance has caused the villager to lose their source of income, especially those who dependent on mangrove for livelihood. Some of the villager had to look for other jobs. Monkeys, which lost its mangrove habitats, migrated to village areas and became nuisance and also caused the villagers to lose up to 50% of their crops. The local populace also experienced poor quality of life as result of monkeys invasion and damage caused to their household items. Almost 2 to 3 times a year, the waterways will overflow causing floods in the residential and plantation areas. Loss of income due to loss of mangrove forest to shrimp farm development caused several hardship and loss income to the people of Bagan Tenglorak and fishermen in particular due to smaller yields.

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