

# Cambodia: Mangrove-friendly aquaculture

SO SREYMOM

Agricultural ASEAN Unit  
Department of Planning and Statistics  
Ministry of Agriculture, Forestry and Fisheries  
Phnom Penh, Cambodia

## Abstract

Cambodia has 435 km of coastline with 85,000 ha of mangrove forest. A big part of the mangrove area is in Koh Kong province (63,700) where intensive shrimp culture activity is also concentrated. Shrimp (*Penaeus monodon*) farms occupy 850 ha, producing 450 tons/yr (1995). But lately, production decreased by 20% due to diseases and self-pollution. The government has since placed restrictions on shrimp farming.

## Introduction

Cambodia has rich and diverse natural resources. Along its 435 km coastline are large estuaries with a total of 85,100 ha of mangrove forest. Though its coastline is smaller than those of other countries in Southeast Asia, it still has large and small bays, inshore and offshore islands with relatively pristine habitats. Fortunately, Cambodians for a long time were more interested in inland waters, leaving the coasts relatively pristine. But beginning the 1970s, these areas became disturbed by exploitation and development, and management has been poor, if not absent.

Cambodia has joined the Biodiversity Convention in February 1994, but because of economic depression and poverty, national awareness on the importance of biodiversity conservation is very limited. Competition for coastal and marine resources has been very aggressive in recent years.

There are many efforts and attempts by non-government organizations and international organizations to collaborate with the Ministry of Environment and the Ministry of Agriculture, Forestry and Fisheries to improve environmental protection.

## Exploitation of mangrove forests

The mangrove vegetation of Cambodia spreads nearly all along the coastline, though large and dense forests are found at Peam Krasob, Andong Tuk, Sre Ambel, Chak Sre Cham and the delta of Prek Kompot. LANDSAT (1994) showed that in 1992-1993 mangroves cover about 85,100 ha -- 63,700 ha are located in Koh Kong province, 13,500 ha in Sihanouk Ville city and 7,900 ha in Kompot province and Kep resort city (Figure 1). The mangrove flora of Cambodia belong to 35 families, 53 genera and 74 species. *Rhizophora mucronata* and *R. conjugata* are dominant.

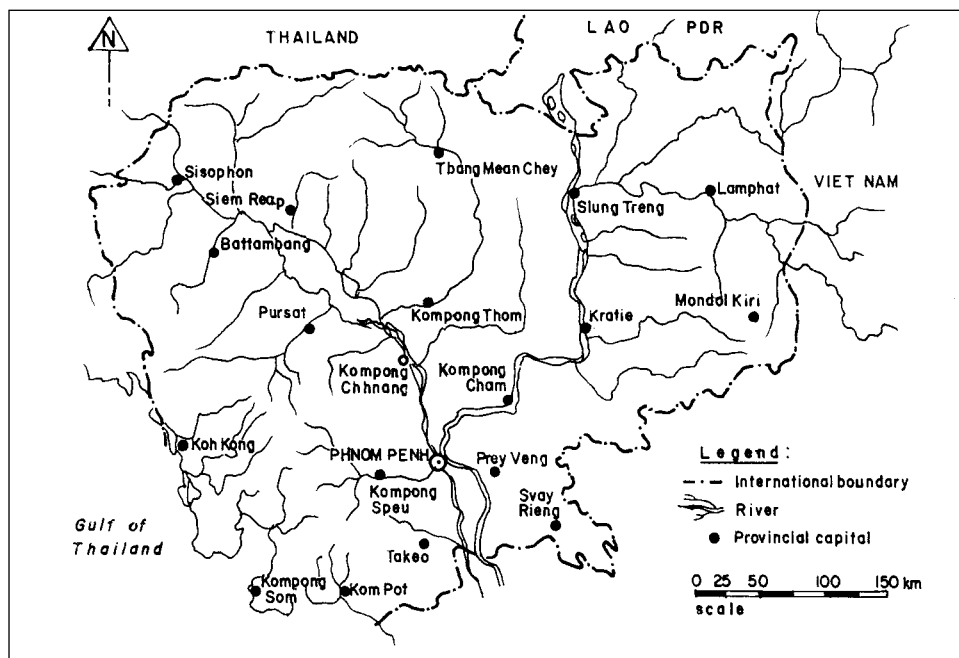


Figure 1. Map of Cambodia

Unplanned exploitation of coastal resources including mangroves, fisheries, and forestry resources has led to environmental degradation. This will continue while local communities are still developing economically. The current kinds of exploitation of mangrove areas are:

- fire wood and construction materials for domestic purposes and for export
- intensive charcoal production for domestic use and for export
- land claims for intensive and extensive shrimp culture
- land claims for salt pans and/or occupation of land for other purposes

Mangrove exploitation reportedly started during the French Protectorate period though there was a reforestation program in Koh Kong province. The use of mangroves for firewood and charcoal took place during the war, and has intensified due to poor management. Smuggling charcoal to Thailand has been recorded to be about 20 tons/day since 1994.

Until now, there is no comprehensive management or conservation activities such as inventory and reforestation. The mangrove resource has been placed under the jurisdiction of the Department of Fisheries (DOF) in 1989. Some measures to stop illegal or non-licensed activities have been frustrated due to poor strategy.

### **Aquaculture in mangrove areas**

Intensive shrimp culture activities in Cambodia is carried out mainly in Koh Kong province which is near Thailand's Trat province. A DOF survey in 1995 showed that shrimp farms cover an area of 850

ha with production of 450 tons/year. But these areas have been reduced by 20% due to disease outbreaks.

The main cultured species is *Penaeus monodon*. Pond yields are reportedly high (up to 7-8 tons/crop) for new starting farms, and profits are attracting further investment. However, the industry in Koh Kong is increasingly feeling the negative side-effects common to intensive shrimp farming, including economic losses due to shrimp disease outbreak and self-pollution caused by indiscriminate discharge of pond effluents. There are also resource conflicts, particularly with farms located in or near mangrove areas.

A survey by the Bangkok-based Network of Aquaculture Centres in Asia (NACA) in early 1996 concluded that intensive shrimp farms have an average production of 7,545 kg/ha/year with a sale value of US\$42 million/year. But shrimp farmers face significant environmental problems (especially in sites located in acid sulfate and/or acidic sandy soil) with an estimated loss of US\$28.6 million/year. These high losses require urgent action to improve environmental sustainability of shrimp farming in Cambodia. These problems have pushed the local government and concerned ministries (Agriculture, Forestry and Fisheries, and Environment) to place a moratorium on further licensing of shrimp farms for the time being.

Other farming systems like oyster and mussel culture are not significant in terms of production.

### **Management of shrimp farms**

DOF has placed the following restrictions on shrimp farming:

- no encroachment of mangrove forests by shrimp farms
- treatment of shrimp pond wastes before these are discharged to the sea
- construction of shrimp farms 150 m behind the shoreline

However, these guidelines are not respected and enforced, even though the shrimp farmers are aware of the negative impact of shrimp farming on the environment.

To reduce the threats to mangroves, a series of workshops has been conducted and attended by 130 participants from 26 villages. Guidelines on the conservation and sustainable use of mangrove resources were formulated. Though the designation of reserves and protected areas provide benefits to the environment, the local communities fear losing their benefits from daily use of the mangrove resources.

### **Policies on fisheries management**

#### *National policy*

In the current Socio-economic Development Plan (1996-2000), the national fisheries policies aim to:

- improve fisheries products for home consumption and export
- manage, conserve, protect and sustainably develop sustainable fisheries resources
- emphasize inland aquaculture in rural areas as a protein source and as supplementary food produce

*Development objectives and strategies*

DOF objectives are to:

- supply enough food for all Cambodians
- protect and conserve natural fisheries resources
- revise the existing fisheries law
- improve the management of capture fisheries
- develop the inland and marine aquaculture sectors
- involve local people in fisheries management, conservation and development
- develop fish processing, handling and marketing technologies
- develop scientific research and extension in fisheries

### **Conclusion**

The approach to coastal development, management and conservation needs to be systematically done through the basic objectives remain to be sustainability, equity and efficiency for the targeted provinces along the Cambodian coastline. This development program requires:

- strong provincial government support
- capacity building
- well-placed production infrastructure and services
- master plan for human settlement and its management
- master plan for coastal zone management
- people participation in development and management of natural resources
- international/regional cooperation

### **References**

- Limsong S. 1998. Mission report on fisheries in Kompot Province and Sihanoukville. Department of Fisheries
- Dara C *et al.* 1998. Case study on management of fisheries, coastal resources and the coastal environment in Kampot Province. Ministry of Environment
- Cambodian Group Working. 1998. Draft synthesis report on management of fisheries, coastal resources and the coastal environment in Cambodia: Institutional, legal and policy perspective. Ministry of Environment
- Kosal M. 1996. Mangrove resource management with emphasis on Cambodia. Ministry of Environment
- Tana TS. 1996. The implication of local communities and coastal resources exploitation in Koh Kong Province, constraints and opportunities for sustainable human settlement development management and natural resources conservation. Department of Fisheries
- Tana TS. 1996. The marine and coastal biodiversity resources of Cambodia -- habitats under pressure. Department of Fisheries