

## CHAPTER 1

### INTRODUCTION



#### Origination of the Thesis Topic

Since 1985, aquaculture of shrimp has rapidly expanded into semi-intensive and intensive culture techniques for black tiger shrimp (*Penaeus monodon*). Culture shrimp production, accounting for only 13,006.75 tons in 1984, increased tremendously to 163,000 tons in 1992, and is worth over 18,000 billion baht (Siri Tookvinas, 1992). On the other hand, the rapid expansion of shrimp farms in the coastal areas has been causing serious impact on the ecological system which includes degradation of coastal water and soil quality, acidification, increase the risk coastal erosion from storm surges and wind, salinization of groundwater and agricultural land, and as well as social aspects (Tussanee Chantadisai and Wipada Apinan, 1985; Sanit Aksornkoae and Nittharatana Paphavasit, 1990).

One of the important results of increasing shrimp culture is mangrove destruction. Mangrove are often selected as the first sites to be considered for shrimp farming because of easiness in salt water supplies to the aquaculture system. It has been reported that 158.72 km<sup>2</sup> of mangrove was cleared during the shrimp culture boom period (1986-1989) (Siri Tookvinas, 1992). Since mangrove have important ecological functions on the coastal zone, large-scale denudation of mangrove might cause many negative impacts on coastal zone ecology, especially on mangrove function in contributing to aquatic productivity of the nearshore. The requirement for more information on ecological impact of shrimp farming on coastal ecological systems is urgently needed for proper problem solving and management.

## Objective and Scope of the Study

### Objectives

The objectives of this study are :

- To study the impact of shrimp farming on mangrove coverage area by using remote sensing technique.
- To study the impact of shrimp farming on estuarine fishery production.
- To study the change, situation, and trend of landuse and coastal resources which could be classified as :

Mangrove	Standing Tree	Swamp
Shrimp Farm	Grassland	Mangrove Clearing
Paddy Field	Residential Area	

- To develop a knowledge driven model for representing shrimp farm expansion.

The objective of this study were formulated on the hypotheses that:

1. Mangrove influences contributes to the production of estuarine fisheries, therefore destruction to this ecosystem should have negative impacts on fishery production.
2. Expansion of shrimp farms in the study area is the major cause of the extensive loss of mangrove area.

### Rationale of the Hypotheses

1. It is well recognized that mangrove ecosystem contributes to aquatic productivity by detritic energy pathway. Furthermore, the mangrove area also provides nursery ground and feeding ground for many species of finfishes as well as crustaceans. The conversion of mangrove to shrimp farms and other types of landuse could have lasting impact on the production of estuarine fisheries through out the food chain.

2. Although there are many activities taking place in mangrove resulting in reducing of mangrove area, in the case of Thailand, it is expected that the major cause of mangrove area decrease in the study area is shrimp farming.

### **Scope of the Study**

In this thesis, shrimp farming means the activities including shrimp rearing pond, water system and other constructions in the farm area. Broodstock catching, nauplii and post larvae distribution, which are the ancillary business of shrimp aquaculture, are not included.

### **Components of the Thesis**

This thesis comprises five chapters including this introduction. Chapter 2 gives the backgrounds concerning the importance of mangrove and shrimp aquaculture together with the environmental impact of shrimp aquaculture on the ecological environment. Chapter 3 provides the principle and methodology in using remote sensing technique as a tool to classify landuse. Concepts on the logical model for shrimp farm expansion developed and used in this study, together with model result justifying, could be found in Chapter 4. Chapter 5 summarizes the impact of shrimp farms on coastal ecosystems in the study area.

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