หอสมุดกลาง สถาบันวิทยบริการ จุฬาลงกรณ์มหาวิทยาลัย

CHAPTER I

INTRODUCTION

Mangroves are one of the biotic complex ecosystems due to their diversed flora and fauna compositions. In Thailand, mangrove forests distribute along the coastal provinces of the Gulf of Thailand and the Andaman coastlines.The remaining mangrove area from the remote sensing imageries in 1989 was approximately 1,128,494 rai as shown in Table I-1

Table I-1 The remaining mangrove area in Thailand from the remote sensing imageries in 1989 (Adapted from The Seventh National Seminar on Mangrove Ecology, 1991)

	Area(rai)	Area in Percentage(%)
Andaman coastline	888,584	78.84
Lower Gulf of Thailand	106,775	9.46
Inner Gulf of Thailand	3,725	0.33
Eastern coastline	129,430	11.47
Total	1,128,494	100.00

The significance of the mangrove forests are summarized in three ways:

1. Exploitation of mangrove woods: Woods from mangrove forest are mainly harvested for charcoal production especially Rhizophora apiculata and R. mucronata (Aksornkoae et.al. , 1986: Aksornkoae, 1989). The rest are used for houseposts, supporting posts and fishing gears. Beside the mangrove timber, tannin in the bark can be extracted for the ink, paint, wood glue, dying bag-net and tannery.(Aksornkoae, 1989; Dej-anat and Denrungruang, 1988 and Soitongcome and Chunwarin,1988)

2. Fisheries: Mangroves serve as the nutrient sources for aquatic organism. The primary food source for organisms is detritus which is derived from mangrove litters. These detritus will served as food for filter feeders and deposit feeders, while the dissolved nutrients are utilized by phytoplankton and mangrove plants. These primary producers will lead to consumers from higher trophic levels in the mangrove food webs. Mangrove are also valuable as shelters and nurseries for the commercial aquatic species especially in the earlier stages of their lives. Several studies of mangrove-associated fish communities in Thailand provide evidences that Thai mangrove forests are used by fish as nursery grounds, permanent habitats and breeding grounds in the case of some coastal species (Kaosirikul, 1975; Suvapepun et. al., 1979; Wattanachai, 1979; Tamiyavanich, 1984; Muromo et. al., 1985; Boonruang, 1985; Naiyanetr, 1988 and Paphavasit, 1991).

The commercial aquatic species such as tiger prawn, Penaeus monodon; white prawn, P. merguiensis; Mullet, Mugil dussumieri; seabass, Lates calcarifer; mudcrabs, Scylla serrata and oyster, Crassostrea sp. were caught for food.

3. Maintainance of the coastal ecology: Mangroves play an important role in preventing coastal erosion. Their root system trap sediment thus prevent soil erosion and help to expand the mud flats. The physico-chemical studies conducted in the Ranong mangrove forests showed that the mangroves serve two key functions in the coastal ecosystem:

a) the mangrove trap fine sediments carried into the coastal zone by flood waters.

b) there is a significant net export of nutrients from the mangroves into the coastal zone, which acts as a source of enrichment for marine environment. Nutrients derived from non-mangrove sources upstream accounted for less than 10% of the total nutrient exported. Consequently 90% on nutrients are believed to come from mangrove sources (UNDP/UNESCO Regional Mangrove Project RAS/86/120,1992)

Mangrove forests in Thailand have been converted to other uses. The latest survey in 1986 on the mangrove conditions in Thailand revealed that the total mangrove area of 1,071,701 rai was converted for other activities. The high rate of mangrove

destruction occured in the southern part, the eastern part and the central part in respective degree. Land reclamation for aquaculture especially shrimp ponds is the major cause in diminishing mangrove forests of Thailand. Table 2 shows the percentage of the mangrove area reclaimed for other uses between the year 1980-1986.

Table I-2 Land reclamation in mangrove areas for various human activities between 1980-1986 (Adapted from The Seventh National seminar on Mangrove Ecology, 1991)

Activities	mangrove area(rai)	(%)
Aquaculture(shrimp farms)	689,120	64.30
Mining	34,066	3.20
Salt ponds	66,000	6.20
Other activities	282,515	26.30
Total	1,071,701	100.00

Since land reclamation for shrimp ponds in the mangrove areas bring high profits in contrast to low investment. The business therefore, is like the boom in the coastal area. After 4-5 years, water quality in the shrimp ponds and nearby coastal area is affected from the shrimp farming. Water quality is one of the most important factors to be considered in aquaculture. If the water is contaminated with pollutants, the shrimps will

die in a few days. The polluted water resulting from shrimp farms is characterized by low oxygen content, due to high organic substances draining out from the farm inducing the plankton bloom. The feed that dissloved in water or settled to the floor surface will induce some hazard microorganisms growths. This in turns will create disease in shrimp. Klankamsorn(1991) found that three main problems for the shrimp farming in Amphoe Klung, Changwat Chantaburi are the problem of draining water, water quality and insufficient labour. From these problems, 40% of the farms were abandoned. The trend of this phenomena will increase, and soon these areas will turn wasteland. Therefore, the aim of this thesis is to find the suitable or pioneer mangrove species that can grow and survive on these areas in order to be the database for the rehabilitation of the abandoned shrimp ponds to mangrove forests.

1.1 Objectives

1. To study on the height growth and survival rate of *R. apiculata*, *B. gymnorrhiza* and *C. tagal*.

2. To study on soil parameters which influenced the growth and survival rate of mangrove species.

3. To apply the study results for mangrove reforestation in abandoned areas after shrimp farming.

1.2 Scopes of work

The reforestation started in February, 1993 and finished in the same month of the next year. The selected mangrove species were *Rhizophora apiculata, Bruguiera gymnorrhiza* and *Ceriops tagal*. In this experiment, plant observations on height growth and survival rate were carried out every two months. Water quality measurements were carried out as the same time as plant observation. While the soil parameters were carried out every four months for one year period. The soil samples were analyzed in laboratory using appropriate and well known standard methods. The obtained data and results were determined in terms of statistics to find the significance and correlation between the related parameter.

1.3 The Expected results

Suitable mangrove species can be identified for replanting on the abandoned shrimp farm.

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย