

[Meeting Report]

Mangrove Forest Conservation in Thailand

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ABSTRACT

In Thailand, the mangrove forests occupy the areas along the gulf of Thailand and the Andaman sea coastlines with the total area of about 367,900 ha in 1961. Unfortunately, between 1975 and 1993, the mangrove forests of Thailand has been seriously destroyed for various purposes such as human settlements, road constructions, mining activity and shrimp farms until it remained of 168,682 ha. However, most of the mangrove areas (85%) under the concession mangroves designated form logging especially the charcoal production are still good condition and they distribute along coastal lines of Andaman sea. Clear felling in alternate strips was introduced to mangrove forest management with 15-year concession since 1968. Thirty four mangrove forest management units were established to manage and control the mangrove areas. Due to the mangrove areas has been converted into shrimp farms and other activities increasing each year. In order to have proper mangrove management, the Government has decide to classify the mangrove areas into 2 zones; conservation and economics. The government has also set a plan for mangrove re-afforestation each year and during 1992-1995 about 13,569 ha had been replanted. Four seed production centers were already constructed to support seedlings for the local people to plant in the unproductive or degraded mangrove forests near the communities. The mangrove areas which composed of various kinds of plants and animals will be reserved for studying biodiversity and other related areas. Recently on 16th July and 13th August 1996 the cabinet's resolutions approved that the remain mangrove of Thailand including concession mangrove area should be protected seriously and recovered as hurry as possible.

Key words: Mangrove, Conservation, Reforestation

Introduction

Mangrove are very important valuable resources. They have become the great economic significance both in term of production and protect erosion. Mangrove are now threatened throughout the world by traditional users exceeding the sustainable-yield limit in the harvests of direct products and now also by large-scale commercial woodchip charcoal operations. Moreover, fish ponds, shrimp farms and residential development are increasing. Both over exploitation and conversion activities can result in severe socioeconomic consequences for coastal peoples and their regional economics. In addition, many plant and animal species are now threatened with extinction in mangrove areas, and this can be

expected to increase steadily unless rational multiple use management for sustainable yield can be implemented.

In Thailand, mangrove are use for many purposes. (1) Forest product: The main product are firewood, Charcoal and posts. (2) Fisheries production: Many commercially important fishes, crabs, prawns and various kind of molluscs use mangroves as nursery ground and also shelters during their juvenile stages. (3) Protecting of coastlines and river bank against tidal bores and cyclone. (4) Reserve for park and wildlife sanctuary. Unfortunately, mangrove occupied the coastal area of 312,700 ha in 1975 has been seriously destroyed for land reclamation, road constructions, mining activity and shrimp farms. The remaining mangrove area in 1993 approximates 168,682 ha. In order to

protect the remaining mangroves, the cabinet's solutions were issued to manage mangrove resources for sustainable use and sustainable development.

Results and Discussion

Extend and area distribution

In Thailand, mangrove forests develop on the sheltered muddy shores and low lying boggy ground of river and stream estuaries along both banks of the gulf of Thailand and on the west coast of the peninsula facing to the Andaman sea . The extent of mangrove forests in 1961, the total mangrove forest area of the country was approximately 367,900 ha. Due to the conversion of mangrove areas for various purposes has been increasing each year, the mangrove areas have

decreased to about 168,682 ha in 1993 (Table 1).

This indicates that an annual conversion of mangrove areas declines at rate of 6,225.53 ha during 1961-1993 (Table 2).

The best developed mangrove forest in Thailand occurs on the west coast of peninsula in Ranong, Phang Nga, Krabi Trang and Satun, while the mangroves in the inner and western part of the gulf of Thailand are mainly converted into shrimp farms and the remain mangroves composed of small sized trees due to these mangrove forest having been over cut for many years.

Mangrove forest concession

In Thailand, the timber exploitation of mangrove species had never been worked out for commercial purpose at the very beginning of mangrove forest management.

Table 1. The mangrove forest area in Thailand (ha)

Province	1975	1979	1986	1989	1991	1993
Central region	36,500	31,232	1,016	596	406	5,363
Samuthprakarn	600	1,040	103	-	-	312
Bangkok	-	-	-	-	-	200
Samuthsakorn	18,500	14,416	142	-	-	1,819
Samuthsongkram	8,200	7,648	49	-	-	924
Petchaburi	8,800	7,792	577	489	336	2,068
Prachuap Khirikhan	400	336	145	107	70	40
East Region	49,000	44,144	27,981	20,709	11,084	13,048
Trad	10,600	9,840	8,818	8,638	7,750	7,668
Chantaburi	26,100	24,064	14,507	8,696	2,663	4,072
Rayong	5,500	4,608	2,418	1,758	154	680
Cholburi	3,800	3,312	1,498	1,048	150	92
Chachoengsao	3,000	2,320	740	569	367	536
Eastern Coast of th Peninsula	35,500	33,776	19,644	17,084	13,980	16,424
Chumporn	7,400	6,928	3,626	2,265	1,818	3,293
Suratthani	3,700	5,808	4,284	3,767	2,204	3,164
NakhonSi Thammarat	15,500	12,832	8,836	8,521	8,025	7,996
Phatthalung	1,900	1,632	105	84	60	128
Songkhla	5,900	5,184	965	688	229	548
Pattani	1,100	1,392	1,828	1,759	1,644	1,295
Western Coast of th Pennisula	191,700	178,156	147,796	142,170	148,351	133,847
Ranong	24,200	22,592	21,614	21,182	19,470	19,308
Phang Nga	51,100	48,176	36,420	35,626	33,510	30,716
Phuket	3,100	2,848	1,935	1,786	1,554	1,548
Krabi	33,000	31,760	30,312	29,643	31,915	28,527
Trang	34,000	32,864	26,276	25,040	30,849	24,328
Satun	46,300	39,376	31,239	28,893	31,035	29,420
Total	312,700	287,308	196,437	180,559	173,821	168,682

Short-term leases had been issued for domestic consumption and the Royal Forest Department did not have any control on this activities. The mangrove forests were then heavily exploited both legal and illicit practice. It was until July 1966. The cabinet recommended that long term concession of 15 years be issued for mangrove forest under working plan. Due to this circumstance, the concessionaires have to protect the forest under concession and to improve the exploited areas by reforestation at their own expenses. Guideline for this practice will be provided by the Royal Forest Department has to be in charge of fully control all activities practices by lessees. The first mangrove forest concession was issued in 1968 and in the first 15 year period concessions has been issue for 310 felling series with the area of 176,949 ha. At present most concessions finished the first period. Many concession were stopped and mangroves gained reserve status for recreation administered as national parks. Hence, during the second period only 248 felling series remained in the mangrove concession areas, representing an area of 143,961 ha. In regard to the regulation in the second concession period, the RFD has improved and prescribed the concessionaires to recover all cutting areas using their own money. In deteriorated areas outside the concessions, money from the royalty rate of 15 baht per cubic meter of cutting wood has been designated.

Since 1968, a clearfelling in alternate strips system was adopted. Under this harvesting system, the rotation is set and divided into 15 annual coupes which only half of the annual coupe will be cut each year in alternates strips. The remaining strips would be cut in next 15 years. In practice felling will make within the prior marked strip in the annual coupe. Cutting strip would be alternated with the remain strip. Within the cutting strip no seed trees or shelter trees will be left except valuable seedling under 15 cm in girth at breast height. The strip will be at the angle about 45 degree to the tide or water way with the width of 40 m. There are 34 mangrove forest management units throughout Thailand in order to control and protect the mangrove forest area. The main duty is to control the concessionaires in cutting as in regards to silvicultural system and its regulations. Besides, the duties also concerns the improvement of

Table 2. Degradation of mangrove forests in Thailand during 1961-1993

Year	Mangrove area (ha)	Degradation area Area (ha)	%	Degradation rate (ha/yr)
1961	367,900	55,200	15.00	3,940.60
1975	312,700	25,392	8.12	6,356.00
1979	287,308	90,871	31.63	12,982.70
1986	196,437	15,878	8.08	5,290.00
1989	180,559	6,738	3.73	3,369.00
1991	173,821	5,139	2.96	2,569.50
1993	168,682			
Total		199,218	54.22	6,225.53

Table 3. Data of concession mangrove forest (1969-1996)

Province	First period		Second period	
	Felling series	Area (ha)	Felling series	Area (ha)
Trad	3	7,425	2	1,712
Chanthaburi	4	12,159	-	-
Rayong	2	2,278	-	-
Ranong	27	23,675	19	17,616
Chumphon	4	7,111	-	-
Phang Nga	109	39,995	70	25,914
Phuket	3	1,479	2	1,223
Krabi	76	31,034	73	33,410
Trang	44	22,575	44	27,941
Satun	37	28,466	37	35,393
Pattani	1	752	1	752
Total	310	176,949	248	143,961

mangrove forest such as enrichment planting, protecting, yield inventory and research activity. Recently, Royal Forest Department has added another 6 units to develop the mangrove area in Rayong, Petchaburi, Chumphon, Surat Thani, Nakorn Si Thammarat and Pattani along the coastal areas in the Gulf of Thailand.

Mangrove Land Use Zoning

Because of large mangrove areas were converted into shrimp farms and residential areas; hence the conflicts between the government and people occupied the mangrove areas were seriously discussed. In order to solve these problems the government decided to classify the mangrove areas as follow:

I. Preservation zone mean mangrove forest areas that no allowance for development and activities excepts preserved it for environment and ecosystem,

for example,

- (a) Areas are preserved to be nursery food supply and shelter for juveniles fish and crustacean.
- (b) Areas are preserved to be important place for protection coastline as wind break and tidal bore. This area is no less than 75 m from the margin of seaward mangrove and 20 m from the margin of riverward mangrove.
- (c) Areas are preserved to be important historical.
- (d) National park, forest parks, wildlife sanctuary, etc.

The total mangrove conservation zone are about 36,278 ha.

II. Economic zone is divided into 2 subzones as: Economic zone A means mangrove forest areas that follow the use only forest activities for sustainable production, for example,

- (a) Concession forest.
- (b) Outer concession forest suited for conservation in case of community forest.
- (c) Mangrove forest plantation for forest production.

The total mangrove economic zone A are about 199,689 ha.

Economic zone B means mangrove forest areas that allow for other development and land use activities but must be careful about effect concerning with environment, for example,

- (a) Agricultural areas.
- (b) Industrial areas.
- (c) Community areas.
- (d) Commercial areas.

The total mangrove economic zone B about 130,081 ha.

Mangrove reforestation

The management of mangrove forest as previously mentioned are concentrated only the natural forest. The management of artificial mangrove forest or plantation have been established since 1960 but the planting area was minimal. So far up to 1991 approximately 9,000 ha has been planted. The two main mangrove species *Rhizophora apiculata* and *R. mucronata* have been planted. This is due to the wood of both species being suitable for making charcoal. The spacing of planting is 1 by 1 m or 1.5 by 1.5 m. Other species

such as *Ceriops spp.*, *Bruguiera spp.* are also excepted by Royal Forest Department to plant in high mangrove area.

On 24th June 1991, the cabinet's resolution about mangrove plantation was approved and supported budget about 450 million baht to plant the deteriorated mangrove areas about 40,000 ha in very part of Thailand during 1992-1996. Hence, the mangrove plantation area may increase to 49,000 ha in 1996. But only 13,569.20 ha has been planted (34%) because of most mangrove area (85% of remaining mangrove) still belong to concessionaires. Only some parts of outside area could be planted.

Mangrove areas for seed production

In order to serve the mangrove plantation project during 1992-1996, the government also has supported budget about 275 million baht to construct 4 mangrove seedling production centers in Trad and Phang Nga in 1992. Nakhon Si Thammarat and Satun in 1993. The Mangrove Seed Production Centers have been established to serve its main objective as a service station to supply mangrove seedling to GO, NGO, students and local people for reforestation and afforestation in deteriorated mangrove and new mudflat areas along the coastal areas of Thailand.

Mangrove areas for study and research

Because of the mangrove of Thailand occupy along the coastal lines of the Andaman sea and The Gulf of Thailand which compose of different estuarine ecosystems. The mangrove research stations for study and research on mangrove biodiversity and environment factors is very important to conserve and develop each mangrove ecosystem for sustainable use and sustainable development. The various degraded areas of shrimp farms, tin mining, over logging and waterlogging are also need to be recovering base on the scientific data. For these reasons, the cabinet's resolutions on 1st may 1984 and 27th April 1993 were issued to establishment The mangrove Research Center in Ranong and Mangrove Research and conservation stations in every important coastal ecosystems. Hence, The Mangrove Research Center in Ranong has been constructed and more than one hundred scientists from oversea visited for study and do research in this center. For the Mangrove Research and Conservation Station, now they have already

been constructed in Phuket and Nakhon Si Thammarat provinces.

Mangrove policy

Due to the national Economic and Social Development Planning has been developed for developing the country during 1997-2001, in term of mangrove policy, the government has justified that, during this period, mangrove area of Thailand must not lease than 160,000 ha. People participation in mangrove re-forestation, conservation and management should be promoted to implement the national planning. However, before starting the planning period, on 16th July 1996 and 13th August 1996 the cabinet's resolution approved the remain mangrove of Thailand including mangrove concession areas should be protected seriously and recovered as hurry as possible.

Conclusion

The mangroves of Thailand has been heavily exploited for shrimp farming since 1975. Most of the remain mangroves under the concession mangrove (143,961 ha) designated for charcoal production and now are controlled by 40 mangrove management units. The area has divided into two zone, Conservation zone and Economic zone. There are two subzone in Economic zone. Economic zone A is the area can be used for forestry only but Economic zone B allow for other development and land use activities. The reasearch activities and

mangrove re-forestation has been done seriously in every part of the mangrove of Thailand since 1991. Recently, the cabinet's resolutions on 16th July 1996 and 13th August 1996 approved for considering to ban mangrove concession areas and protecting and recovering the remain mangrove area as soon as possible.

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[會議論集]

泰國森林的紅樹林保育

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摘 要

泰國的紅樹林分佈在暹羅灣和安達曼海的沿岸。在 1961 年時的總面積有 367,900 公頃，可是經過了 1975~1993 年間的一連串像是築路、建鎮、開礦、養殖池的開發，紅樹林只剩 168,682 公頃了。其中大部份是可以合法利用的，目前供工作薪炭，長在安達曼海沿岸的紅樹林（約 85%）情況尚屬良好。1968 年起，15 年一輪伐的策略用到了紅樹林的經營方面，政府成立了三十四所紅樹林經營單位經營管理紅樹林。由於紅樹林被轉作為養蝦池和其他用途的事件日增，政府於是把紅樹林分成了保育和利用兩區。政府也同時計劃並實施逐年恢復紅樹林的造林工作。從 1992 到 1995 三年期間就恢復了 13,569 公頃。全國為了復育紅樹林，特別設置了四個種苗中心，供應各社區在荒蕪海邊復育紅樹林的需要。結構完整的紅樹林也將予以保存供做生物多樣性等領域的研究之用。就在 1996 年的六月十六日和八月十三日的內閣會議中核定了泰國全國的紅樹林，包括合法利用的紅樹林，均應予以嚴格的保護。

關鍵詞：紅樹林、保育、造林