

# Mangrove Ecosystems, Communities and Conflict: Developing Knowledge-based Approaches to Reconcile Multiple Demands



## Mangroves in Thailand

Kasetsart University

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NACA Secretariat Office, Bangkok

## Outline

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- General information
- Loss of mangroves
- Management practices
- Ecological & management issues
- Criteria for site selection
- Conclusion & recommendation

# General information

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- ❑ Location of Thailand
- ❑ Situation of mangroves
- ❑ Species of mangroves
- ❑ Distribution of mangroves

## Location of Thailand

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- ❑ Thailand, centrally located in the Indochina Peninsula
- ❑ The total area of Thailand is 513,115 sq.km.
- ❑ 76 provinces

## **Situation of mangroves in Thailand**

- ❑ Thai coast = 2,670 km (Gulf of Thailand = 1,870 km, Andaman Sea = 800 km)
- ❑ Mangrove forest covers 23 provinces along the coast
- ❑ More mangrove in South: Andaman
- ❑ Mangrove area: decreased about 0.12 Million Rai (1.58 Million Rai\* in 2000 → 1.46 Million Rai in 2004)
- ❑ Caused by human activities, especially shrimp farming

*\* 625 Rai = 1 Sq.km.*

## **Three Groups of Mangrove Species**

1. Pioneer species community
2. Rhizophora species community
3. Mixed species community

## 1. Pioneer species community



*Avicennia alba* (Sa Mae Kao)



*Avicennia marina* (Sa Mae Tale)

## 2. Rhizophora species community



*Rhizophora mucronata* (Kong Kang Bai Yai)



*Rhizophora apiculata* (Kong Kang Bai Lek)

### 3. Mixed Species community



*Bruguiera sexangula*  
(Pang Ka Hua Sum Dok Khao)  
พังกาหัวส้มดอกขาว



*Bruguiera gymnorrhiza*  
(Pang Ka Hua Sum Dok Daeng)  
พังกาหัวส้มดอกแดง

### 3. Mixed Species community (2)



*Ceriops decandra* (Prong Khao)  
ไปรงขาว



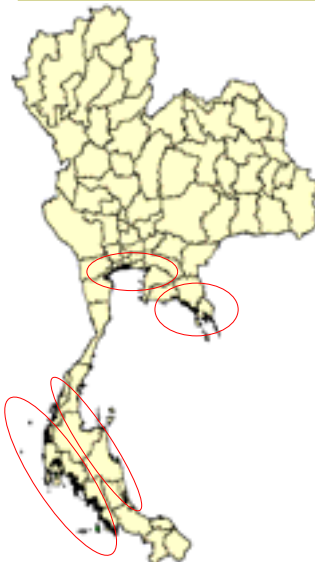
*Ceriops tagal* (Prong Daeng)  
ไปรงแดง

### 3. Mixed Species community (3)



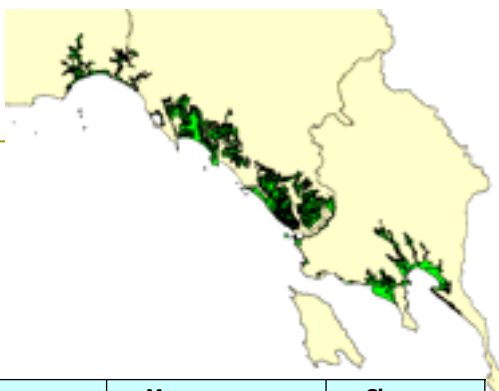
*Nipa fruticans* (Ton Jak)

### Distribution of mangroves in Thailand by region



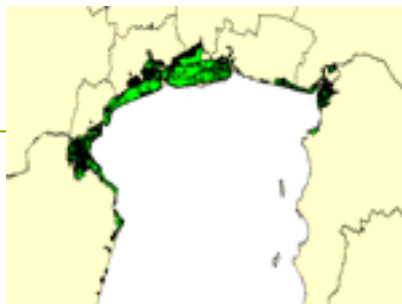
Region	Mangrove area (Rai) 2000	Mangrove area (Rai) 2004	Changes (Rai)
East	165,292.01	152,309.76	- 12,982.25
Central	64,840.02	39,733.80	- 25,106.22
South: Andaman	1,133,633.02	1,089,592.61	- 44,040.41
South: Gulf of Thailand	216,015.72	178,985.70	- 37,030.02
<b>Total</b>	<b>1,579,780.77</b>	<b>1,460,621.86</b>	<b>- 119,158.90</b>

## Eastern part



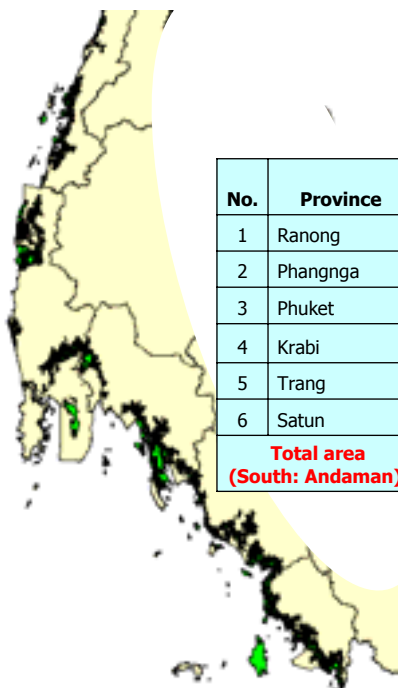
No.	Province	Mangrove area (Rai) 2000	Mangrove area (Rai) 2004	Changes (Rai)
1	Trat	59,482.23	57,436.55	- 2,045.68
2	Chantaburi	78,580.35	73,264.48	- 5,315.87
3	Rayong	11,764.01	9,718.86	- 2,045.15
4	Chon Buri	4,547.87	4,547.87	0.00
5	Chachoengsao	10,917.55	7,341.99	- 3,575.56
<b>Total area (East)</b>		<b>165,292.01</b>	<b>152,309.76</b>	<b>- 12,982.25</b>

## Central part



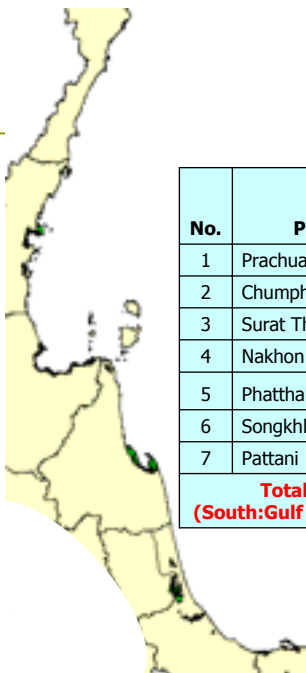
No.	Province	Mangrove area (Rai) 2000	Mangrove area (Rai) 2004	Changes (Rai)
1	Samut Prakan	7,216.02	7,585.14	369.12
2	Bangkok	3,249.09	2,537.28	- 711.81
3	Samut Sakhon	19,252.75	10,530.41	- 8,722.34
4	Samut Songkhram	15,956.57	12,530.26	- 3,426.31
5	Phetchaburi	19,165.59	6,550.71	- 12,614.88
<b>Total area (Central)</b>		<b>64,840.02</b>	<b>39,733.80</b>	<b>- 25,106.22</b>

## South: Andaman



No.	Province	Mangrove area (Rai) 2000	Mangrove area (Rai) 2004	Changes (Rai)
1	Ranong	170,334.80	162,953.19	- 7,381.61
2	Phangnga	262,736.48	276,884.87	14,148.39
3	Phuket	11,724.86	10,504.20	- 1,220.66
4	Krabi	219,338.38	225,649.07	6,310.69
5	Trang	223,676.91	191,317.17	- 32,359.74
6	Satun	245,821.59	222,284.09	- 23,537.50
<b>Total area (South: Andaman)</b>		<b>1,133,633.02</b>	<b>1,089,592.61</b>	<b>- 44,040.41</b>

## South: Gulf of Thailand



No.	Province	Mangrove area (Rai) 2000	Mangrove area (Rai) 2004	Changes (Rai)
1	Prachuap Khiri Khan	3,121.88	1,692.38	- 1,429.50
2	Chumphon	45,291.80	40,284.03	- 5,007.77
3	Surat Thani	58,127.04	40,684.22	- 17,442.82
4	Nakhon Si Thammarat	59,875.64	64,236.87	4,361.23
5	Phatthalung	1,354.38	422.38	- 932.00
6	Songkhla	21,805.11	8,559.78	- 13,245.33
7	Pattani	26,439.87	23,106.03	- 3,333.84
<b>Total area (South:Gulf of Thailand)</b>		<b>216,015.72</b>	<b>178,985.70</b>	<b>- 37,030.02</b>



# Loss of Mangroves

## in Thailand

### Loss of Mangroves in Thailand (1)

- ❑ The population has increased: 26 M (1960) to 59 M (1995) and 63 M (2003).
- ❑ The nation's economy has grown continuously, resulting in an increase in income/capita/year from 2,100 THB (1961) to 77,000 THB (1996) and 62,800 THB (2002).
- ❑ However, increases in population and economic development have led to the uncontrolled use of large quantities of natural resources.
- ❑ Such unsustainable use has resulted in serious environmental degradation.
- ❑ Mangroves suffered the same fate as other natural resources, with mangrove areas being used for industry, agriculture, and residential areas beyond the limits of their natural ability to regenerate.
- ❑ This caused rapid loss and damage to Thailand's mangroves.

(Source: UNEP/GEF/SCS/RWG-M: National Action Plan of Thailand, 2004)

## **Loss of Mangroves in Thailand (2)**

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- ❑ Culture of marine animals, in particular the farming of Black Tiger Shrimp.
- ❑ Increase in population and development (community bases, factories, ports and fishing harbors, and roads)
- ❑ Agricultural production and salt pans
- ❑ Mining in mangrove areas (tin mining). However, most mining concessions have now expired
- ❑ Tree felling exceeding mangrove productivity

(Source: UNEP/GEF/SCS/RWG-M: National Action Plan of Thailand, 2004)

## **Some Mangrove Management Practices in Thailand**

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1. Mangrove Concession
2. Mangrove Zoning
3. Mangrove Plantation
4. Mangrove Areas for Seed Production
5. Mangrove Areas for Study and Research
6. Marine Protected Area (MPA)
7. Mangrove Village: Royal Project
8. The 9<sup>th</sup> 5-Years Plan (2002-2006)

## 1. Mangroves Concession

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- ❑ The first mangroves concession was issued in 1968 and in the first 15 year period, concessions have been issued for 310 felling series with the area of 1,769.49 Sq.km.
- ❑ Since 1996 all mangrove cutting concessions have been suspended.

## 2. Mangroves Zoning in Thailand

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- ❑ In order to reduce the conversions of mangrove to the minimum, the national mangrove forest zoning and management measures was approved by the Cabinet resolution on 15 December 1987 (UNEP, 1998):
- ❑ Classifying mangrove forest area into **3 zones**:
  1. Conservation Zone: 426 Sq.km. (11.46%)
  2. Economic Zone A: 1,996 Sq.km. (53.61%)
  3. Economic Zone B: 1,300 sq.km. (34.93%)

## *Mangrove Zoning: The Conservation Zone*

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where all **utilization and disturbances are prohibited**; this includes:

- a) Areas for preservation of economic plants and animals
- b) Nursing grounds for plant and animals
- c) Areas susceptible to damage and erosion
- d) Historic areas
- e) Area with local uniqueness
- f) National parks, tourist areas, wildlife sanctuaries, non-hunting areas
- g) Wind shield areas
- h) Area significant for research
- i) Area significant for environmental and ecological preservation
- j) Areas more than 20 m. from natural rivers or streams, or more than 70 m. from the sea coast.

## *Mangrove Zoning: Economic Zone A*

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In which only **sustainable uses** of mangrove trees are permitted; this includes:

- a) Concession areas
- b) Community forests
- c) Mangrove plantations

## *Mangrove Zoning: Economic Zone B*

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For degraded mangroves in which other **land uses and developments** are allowed but which must consider the environment; this includes:

- a) Agriculture (crops, husbandry, fisheries, salt farms)
- b) Industry (mining, factories)
- c) Urban areas
- d) Trading and commercial areas
- e) Piers and harbors
- f) Others.

According to this cabinet resolution, **shrimp farms** will be allowed only in **Economic Zone B** and by renting or concession from the Government only. However, as of 23 July 1991 the cabinet issued another resolution to prohibit any new concessions of any kind in any mangrove zone.

## **3. Mangroves Plantation (1)**

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- ❑ Since 1960
- ❑ 2 main mangrove sps *Rhizophora apiculata* and *R. mucronata*
- ❑ Other species such as *Ceriops* spp. and *Bruguiera* spp.
- ❑ 1991 - 1996 the government planted mangroves through a number of various projects but the average annual increase was only 320 Sq.km.
- ❑ The private sectors have participated in government programs and were able to plant about 480 Sq.km./ year (1994 – 1999).
- ❑ However, these numbers are still low and are unable to substitute for mangrove areas which have been damaged.

(Source: UNEP/GEF/SCS/RWG-M: National Action Plan of Thailand, 2004 and Havanond, S., <http://www.assn.moe.go.th/>: April 2, 2005)

## Mangrove plantation (2)



## 4. Mangrove Areas for Seed Production

- ❑ In order to serve the mangrove plantation project during 1992 - 1996
- ❑ The government has supported budget about 275 MTHB to construct 4 mangrove seedling production centers in Trat and Phangnga Province in 1992, Nakhon Si Thammarat and Satun Province in 1993

(Source: Havanond, S., <http://www.assn.moe.go.th/>: April 2, 2005)

## 5. Mangrove Areas for Study and Research

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- ❑ The cabinet's resolutions on 1 May 1984 and 27 April 1993 were issued to establishment the Mangrove Research Center in Ranong
- ❑ Mangrove Research and Conservation Stations in all important coastal ecosystems

## 6. Marine Protected Area (MPA)

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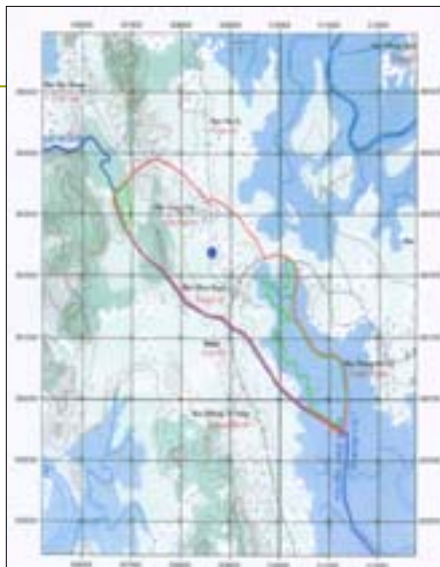
- ❑ Marine National Park (MNP)
- ❑ Department of National Parks, Wildlife and Plant Conservation (DONP), Ministry of Natural Resources and Environment (MONRE)
- ❑ 21 MPAs cover 5,810.23 sq.km. (1.13% of the country)
- ❑ 4 MPAs applying to become World Heritage Sites :  
Tarutao, Surin, Similan and Ao Phangnga MNP

(Source: The World Commission on Protected Areas 2nd Southeast Asia Regional Forum, IUCN, 1999 + <http://www.mekong-protected-areas.org> :Nov 3, 2003)

## 7. Mangrove Village: Royal Project

- By DMCR to celebrate Her Majesty's 6<sup>th</sup> cycle or 72<sup>nd</sup> birthday anniversary
- In the preliminary step
- E.g., Mangrove village project in Village 1, Khlong Yang Sub-district, Koh Lanta District, Krabi Province

- Village location
- Village boundary
- Mangrove area: 906 Rai



## 8. The 9<sup>th</sup> Socio-Economic Development plan: 5-Years Plan (2002-2006)

- Efforts to conserve coastal resources including mangroves.
- The new Environmental Quality Promotion Act has improved coastal management by declaring environment protection zones in several areas to strengthen local capabilities for environmental management.



# Issues

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- ❑ Ecological issues
- ❑ Management issues

## Ecological issues

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- ❑ Conversion of mangrove areas to shrimp farm area
- ❑ Sludge discharged from shrimp farm
- ❑ Waste & Solid water discharged from communities
- ❑ Mangrove area encroachment e.g. mangrove cutting for Oil palm plantation, settlement
- ❑ Tourism development in mangrove area

## Management issues

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- Authority and responsibility for mangrove management in the past has rested with the government
- Limited public and local participation (The constitution of 1997 allows the public to participate in management, use, maintenance, and restoration of natural resources and the environment in order to promote local use and national sustainability)
- Limited co-operation between mangrove management agencies (DMCR, DOF, LDD, RFD, DEQP, PCD)
- Lack of systematic and coordinated monitoring
- Dissemination of information and publicity material are limited and do not reach its target

(Source: UNEP/GEF/SCS/RWG-M: National Action Plan of Thailand, 2004)

## Criteria for site selection

## Criteria for site selection (1)

Region	Mangrove area (Rai) 2000	Mangrove area (Rai) 2004	Changes (Rai)
East	165,292.01	152,309.76	- 12,982.25
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- East & Central:  
Low density of mangroves
- South (Andaman):  
Tsunami
- South  
(Gulf of Thailand):  
Potential site

## Criteria for site selection (2): South (Gulf of Thailand)

	Phatthalung	Prachuap Khiri Khan	Chumphon	Surat Thani	Nakhon Si Thammarat	Songkhla	Pattani
Area	1	2	4	4	5	2	3
Forest types	1	1	4	3	5	1	2
Diversity	1	1	4	3	5	1	2
Abundance (Density, biomass, volume)	1	1	4	3	5	1	2
Economic species	3	3	3	4	5	3	3
No. Community	2	2	2	4	5	4	2
No. Household	2	2	2	4	5	4	2
Resource uses	4	4	4	4	5	4	4
Transportation + Accommodation	4	4	4	4	5	4	1
2 <sup>nd</sup> data	3	2	2	2	5	4	1
Conflicts	2	2	2	5	5	5	1
<b>Total score</b>	<b>24</b>	<b>24</b>	<b>35</b>	<b>40</b>	<b>55</b>	<b>33</b>	<b>23</b>

## Conclusion and Recommendation

- ❑ Nakhon Si Thammarat is received the highest scores
- ❑ Mangroves of Thailand have been heavily exploited for shrimp farming since 1975.
- ❑ Various management programs have been done to conserve and maintenance mangroves.
- ❑ To manage & conserve mangroves,
  - People participation is needed
  - People capacity building should be conducted
  - Need the co-operation between mangrove management agencies
  - Monitoring programs should be set in systematic way
  - Information distribution is also needed

