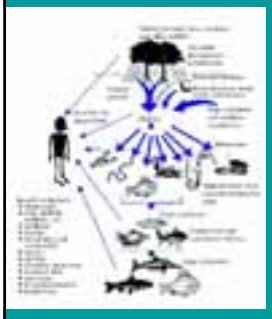
In-depth assessment of mangroves and other coastal forests affected by Tsunami in Southern Thailand

Forestry Research Center

Faculty of Forestry, Kasetsart University

10Sec/100m

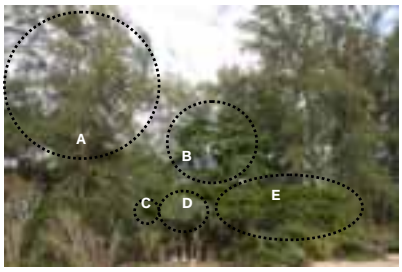
Source:
http://courses.washington.edu/lares



1. Provide nursery grounds for fish, prawns and crabs, and support fisheries production in coastal waters.
2. Produce leaf litter and detrital matter, which are valuable sources of food for animal in estuaries and coastal water.
3. Protect the environment by protecting coastal areas and community from storm surges, waves, tidal currents and typhoons.
4. Produce organic biomass and reduce polution in nearshore areas by trapping or absorbtion.
5. Serve as recreational grounds for bird watching and observation of other wildlife.
6. Source of timber and wood

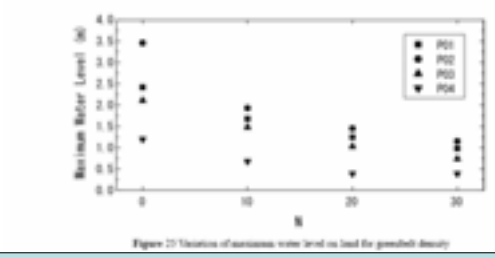
Mangroves and their ecological and economic benefits (Berjak et al. 1977).

Vertical arrangement of Beach forest



A สนทะเล (*Casuarina equisetifolia* J.R. & G.Forst.), B หูกวาง (*Terminalia catappa* L.), C ตีนเป็ดทะเล (*Cerbera odollam* Gaertn.), D เตย (*Pandanus* sp.) และ E หยีทะเล (*Derris indica*)

Water Level at various



- flow pressure in back of Mangrove model

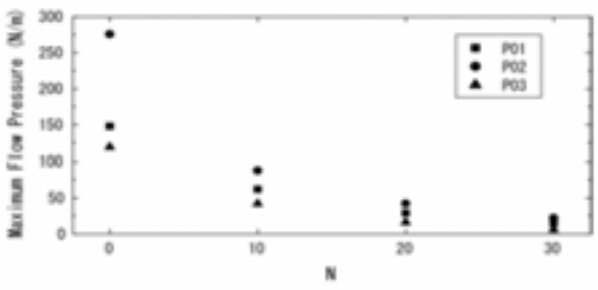
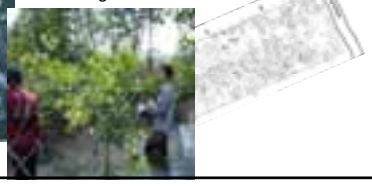


Figure 26 Variation of maximum flow pressure estimated on ground for *N*

Methodol

Forest structure and species composition



-temporary plots with size 10 m x 100 m at mangrove and beach forest
  -sub-plot with size 10 m x 10 m, studied Trees with diameter at breast height over 4.5 cm including with epiphytes
  -4 m x 4 m plot studied saplings
  -1 m x 1 m. plot studied seedlings
-Stratification diagrams and hemispherical photos for detecting the light condition.

- . Forest dynamics
- The forest dynamics including both natural regeneration and their changed by Tsunami influenced were study by all trees, saplings and seedlings were measured at the sample plots, and the damage types which divided into 5 categories; no effect, died by up root, standing death, declination and broken without death were also recorded. Those data will be analyzed to predict the forest regeneration after Tsunami attacked.

soil study

Transect lines were used for soil collection. In each transect line, soil samples were collected in upper 50 cm mineral soil and were analyzed in EC and soil organic matter (SOM) for determination the effect of Tsunami waves.

results

2 layer

A =*Casuarina equisetifolia*,

B = *Terminalia catappa*,

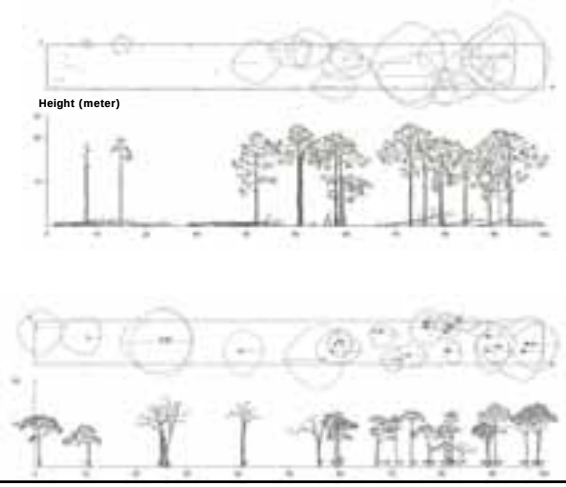
C = *Cerbera odollam*,

D = *Pandanus* sp.

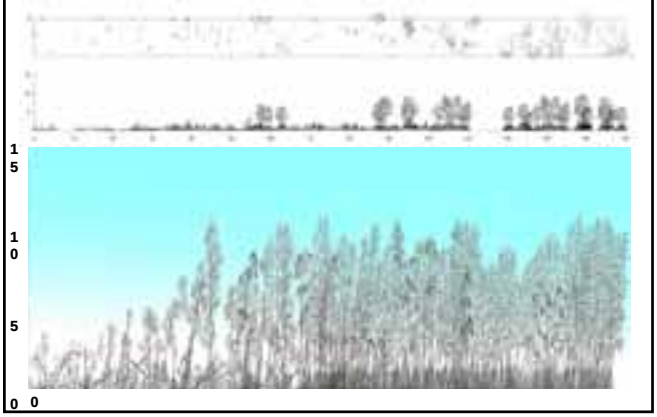
E = *Derris indica*

Name	importance value index
Casuarina equisetifolia	135.40
Derris indica	106.99
Cerbera odollam	53.14
Terminalia catappa	2.27

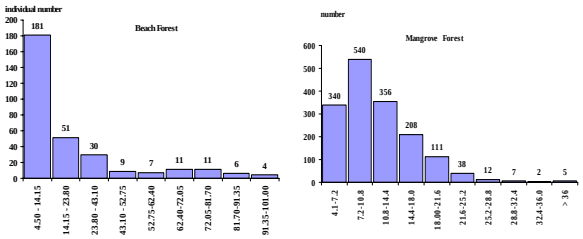
Beach forest



Mangrove forest

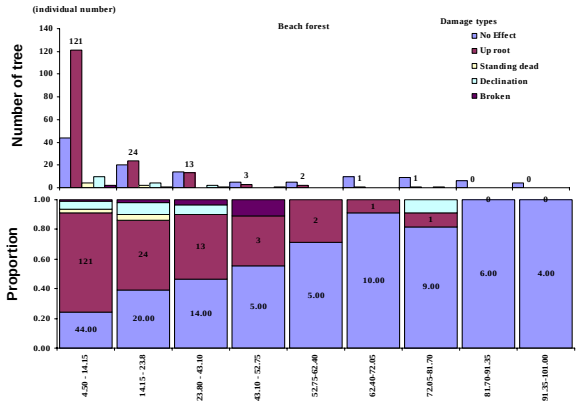


Ranong

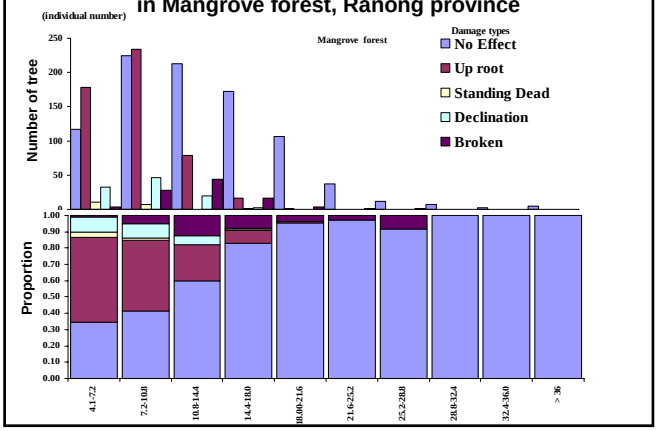


Daimeter class distribution

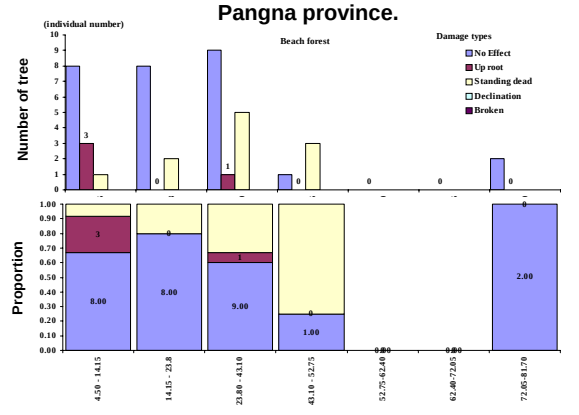
Beach forest, Ranong province.



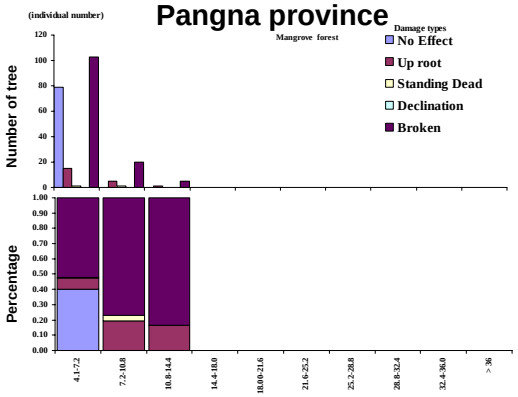
The damage types of each diameter class distribution in Mangrove forest, Ranong province



Beach forest, Bangsak beach, Ban Nam Khem village, Pangna province.

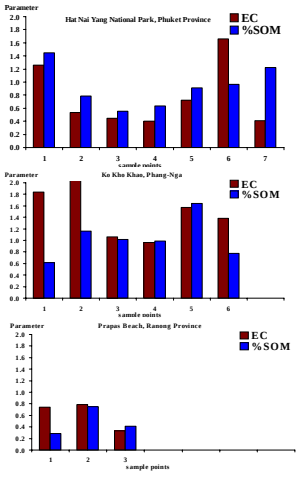


Mangrove forest, Ban Nam Khem village, Pangna province



Matrix of land use change

Compare beach lines



Soil study

- EC (dS/m) and soil organic matter (%) in each horizon of upper 50 cm mineral soil at Hat Ko Kho Khao, Phang-Nga Province

Parameter	Soil horizon (cm)				
	0-10	10-20	20-30	30-40	40-50
EC	1.48	1.94	1.32	1.23	1.41
%SOM	0.54	1.49	1.43	1.05	0.66

Ban Nam Kem, Phang-Nga Province

Parameter	Soil horizon (cm)				
	0-10	10-20	20-30	30-40	40-50
EC	34.48	59.84	64.68	55.73	60.28
%SOM	1.61	2.49	3.05	3.28	2.65

CONCLUSION

- The dominant species of beach forests were *Casuarina equisetifolia, Barringtonia asiatica*, *Terminalia catappa*, *Syzygium* sp., *Pouteria obovata*, *Derris indica*, and *Callophyllum inophyllum.*
- The dominant species of mangroves were *Rhizophora apiculata*, *R. mucronata*, *Avicennia alba* and *Sonneratia ovata.*
- The forest regeneration of beach forest, particularly the dominant species was low process. *Cassuarina and Derris indica* had very high success in competing with other pioneer species. Other pioneer species rapidly occupied any gap areas, including *Gloriosa superba, Ipomoea pescaprae*, and *Chromolaena odoratum.*
- The regeneration of the mangrove forest had very low success due to the accumulated sand and mud on the forest floor.Compared to the number of saplings, only a small number of seedlings were be found. Saplings of *Rhizophora apiculata* showed high success in regeneration

CONCLUSION

- big trees of *Casuarina equisetifolia* in Beach forest were severely damaged by the tsunami and those were uprooted. Some trees in the Mangrove forest were also damaged by the tsunami, especially, *Avicenia alba* and *Xylocarpus* sp. In contrast, *Rhizophora* sp. was high resistant to the strong wind from the tsunami, presumably due to its large and stable stilt roots with very high density.
- A hundred meter distance from the river back into the mid of mangrove forest can be directly influenced by the tsunami.
- all 3 soil study sites of 1 year Tsunami,effect of salt to beach and mangrove forest was less affected because there had some fresh water from rain to dilute the concentration of salt from surface soil.). In the case of soil organic matter, there were some soil organic matter accumulated in the every horizon that could be affected to both beach and mangrove forests