IMPORTANCE OF MANGROVE

- Woody trees/shrubs that grow in coastal habitat.

  Total of 57 true mangrove species recorded in Sungai Merbok, Kedah)

Rhizophora stylosa _ Pulau Sibu,Johor

Matang Mangrove Forest Reserve, Perak

Nipah at the Head of Sungai Bujang, Kedah


•Daily tidal innundation
•Fluctuating salinity
•Unstable & anaerobic substrate
•Wave impacts
The tough gets going

PHYSIOLOGICAL ADAPTATIONS

Prop roots of Rhizophora sp.

PHYSIOLOGICAL ADAPTATIONS

Kneed roots of Bruguiera & Ceriops (Bakau Putih)

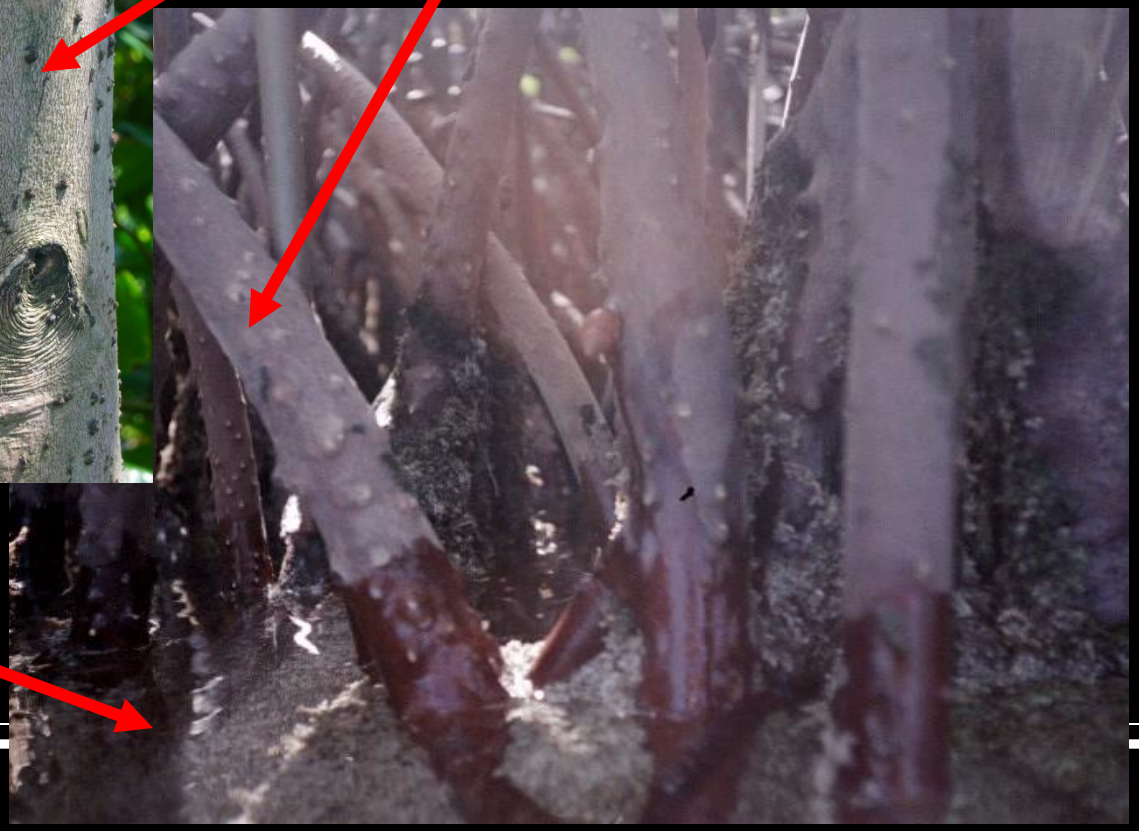
Plank roots of Xylocarpus (Nyireh bunga)

PHYSIOLOGICAL ADAPTATIONS

Pneumatophores of Avicennia (Api-api)

PHYSIOLOGICAL ADAPTATIONS

Mangrove roots & trunks have lenticels for gas exchange



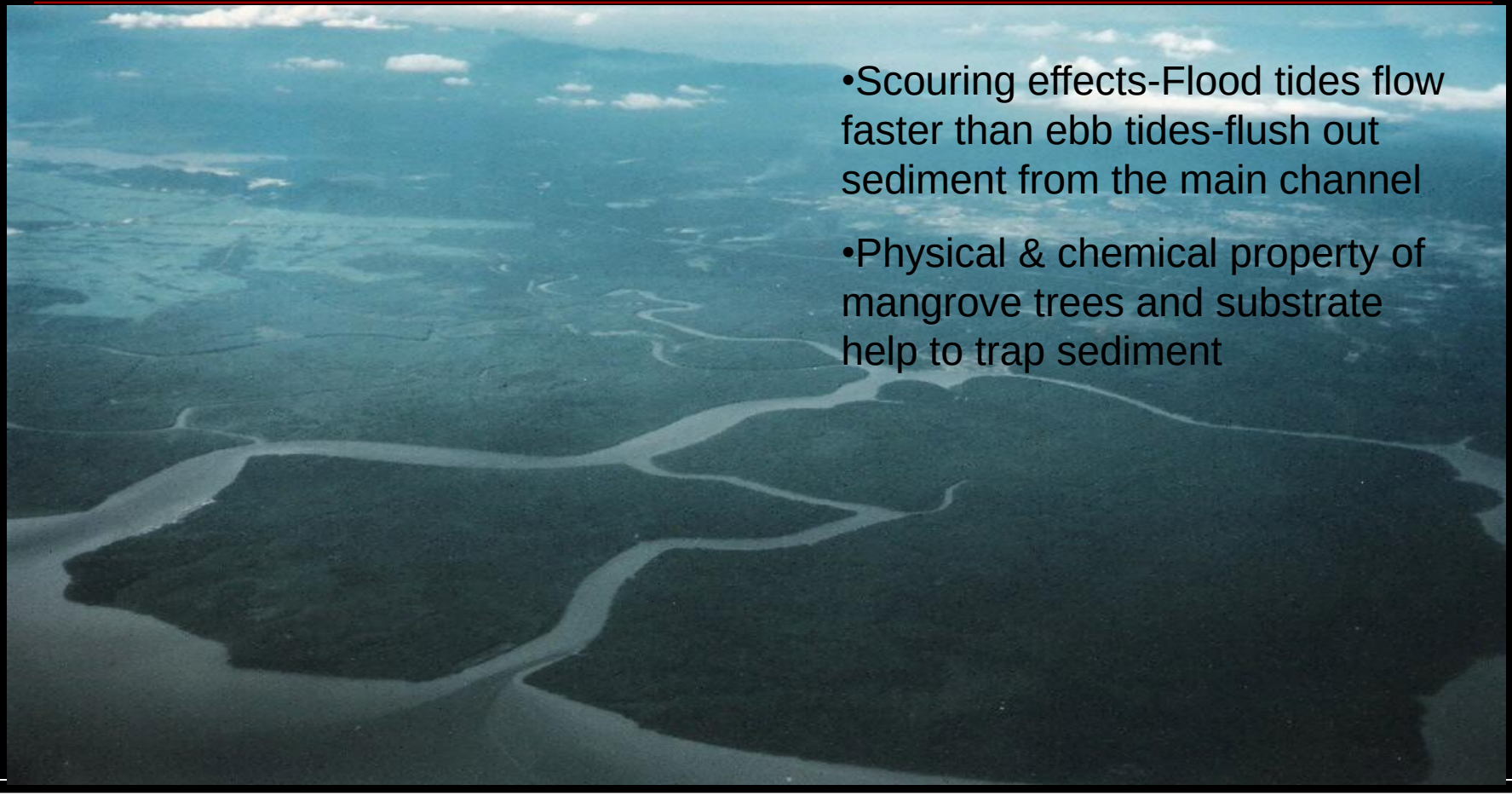
anaerobic substratum

PHYSIOLOGICAL ADAPTATIONS

Vivipary

VALUE OF MANGROVES –

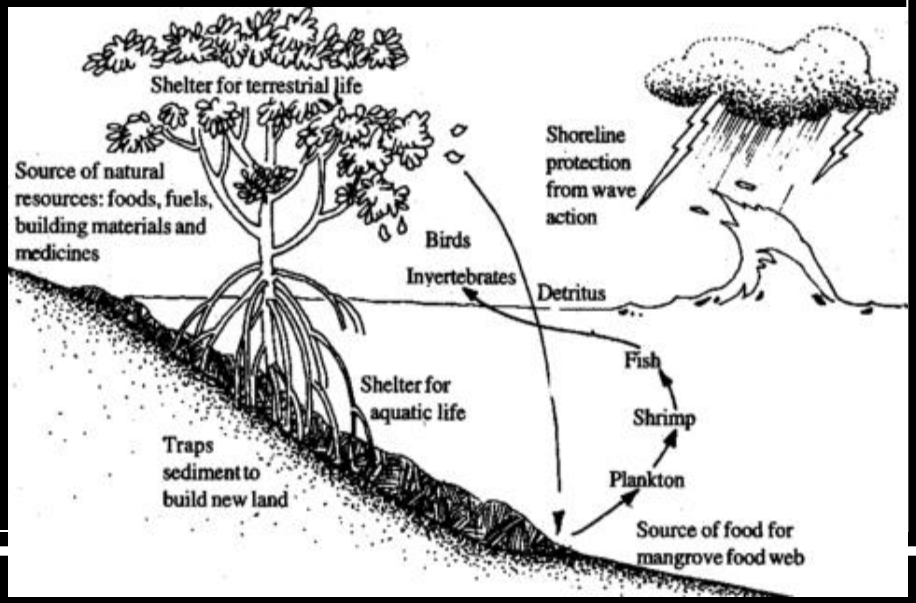
MAINTENANCE OF CHANNEL DEPTH / SEDIMENT ACCRETION



- Scouring effects-Flood tides flow faster than ebb tides-flush out sediment from the main channel
- Physical & chemical property of mangrove trees and substrate help to trap sediment

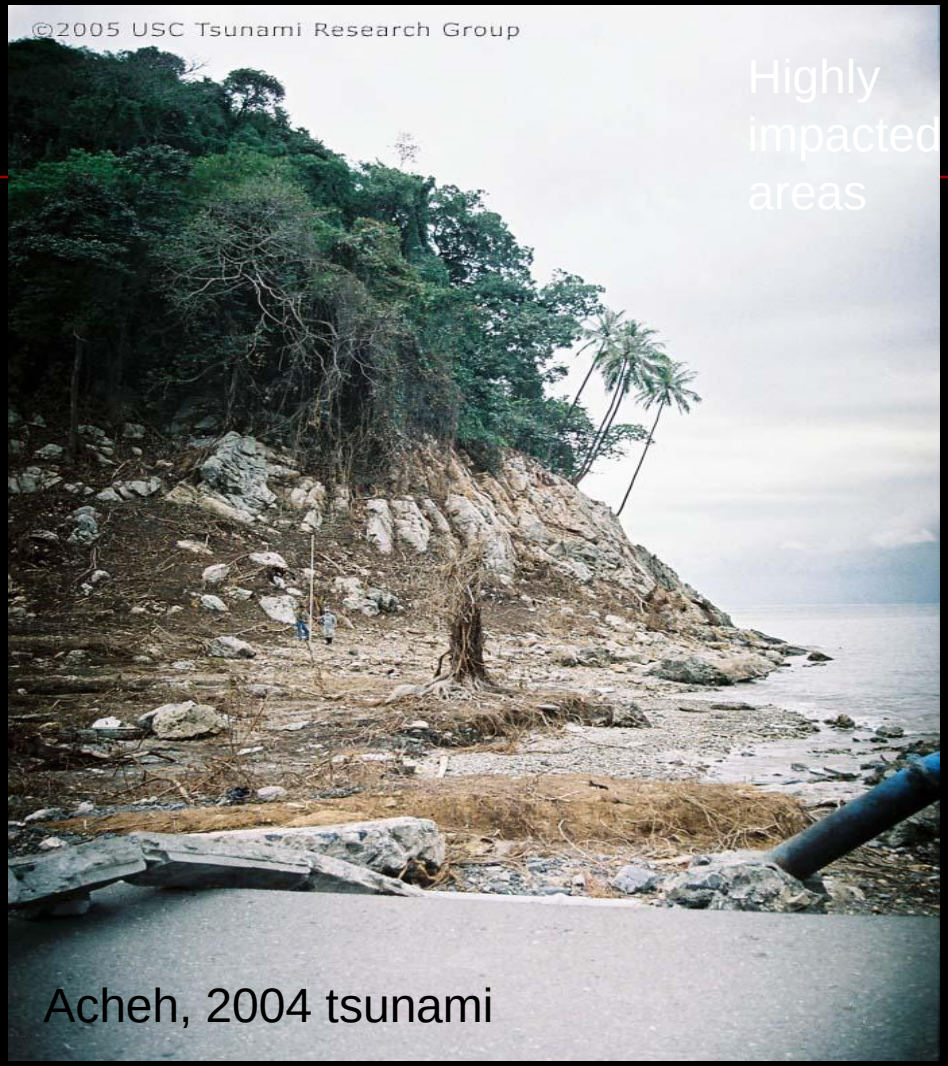
Mangrove as giant water filter system!

- Filtering pollutants from land (Roots help to hold suspended material and assimilating dissolved nutrients.)
- Stabilization of bottom sediments (water less turbid).
- Overall water quality improvements.



VALUE OF MANGROVES –

COASTAL PROTECTION



VALUE OF MANGROVES –

COASTAL PROTECTION

Moderate to low tsunami impacted area

VALUE OF MANGROVES –

COASTAL PROTECTION

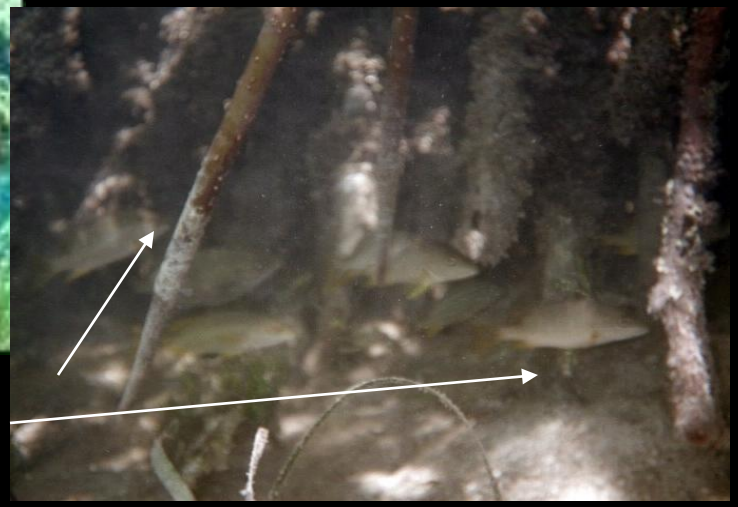
Penang Scenario

VALUE OF MANGROVES – *TIMBER*

Matang Mangrove Forest Reserve
40,466 hectares,348 kilns.
Revenue Of RM29.73 million annually.

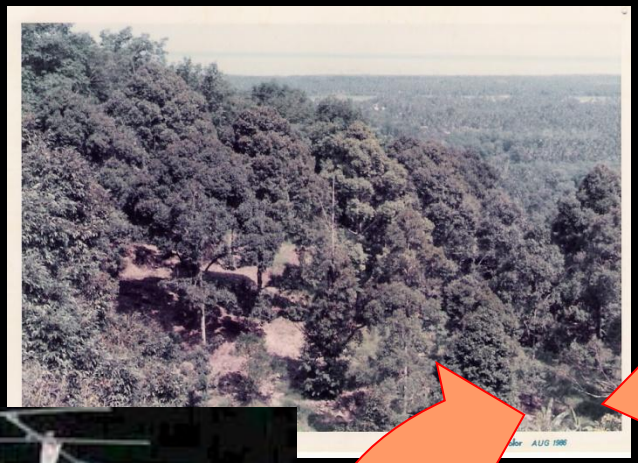
VALUE OF MANGROVES –

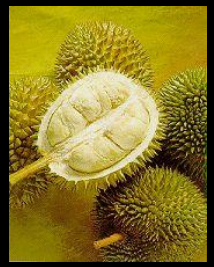
Fisheries / Reef-Mangrove connection



Mangrove roots provide shelter for snappers

Value of mangroves –
durian production





No mangrove, no durian?!

Watzke & Lensing, 2003

VALUE OF MANGROVES –
OTHER PRODUCTS

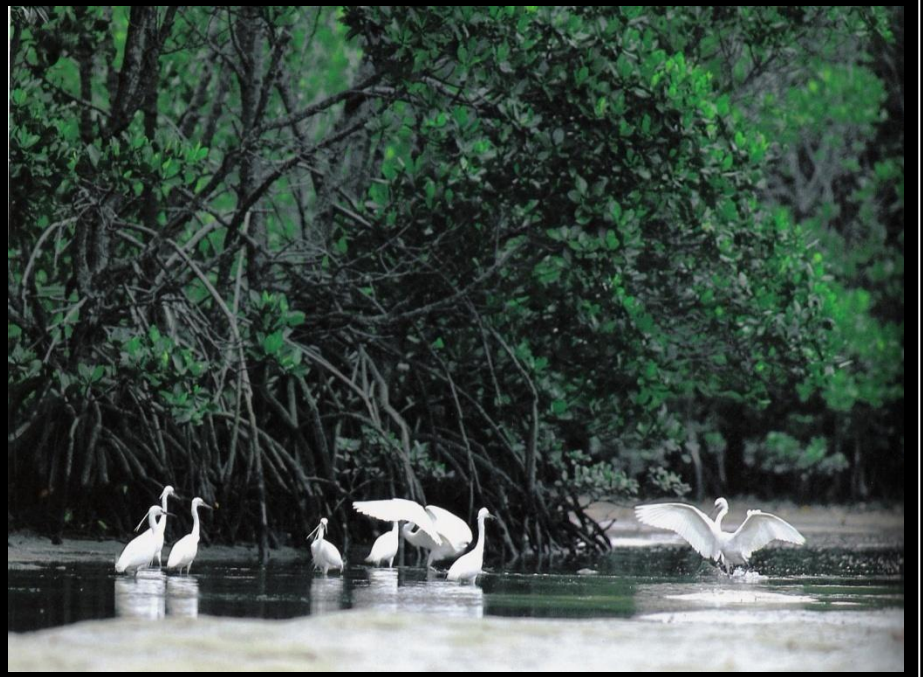
***Anadara granosa* (Blood cockle)**

***Polymesoda expansa* (Lokan)**

***Episesarma sp*. (Vinegar crab)**

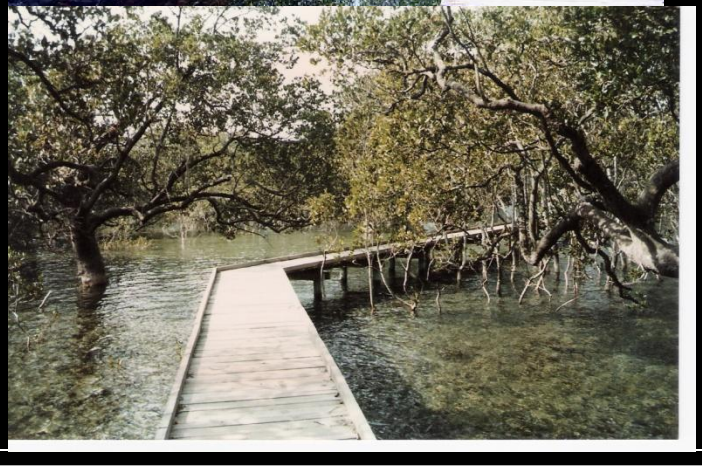
Fruits of Nipah Palm

VALUE OF MANGROVES –
BIRD SANCTUARY / MIGRATORY STOPS



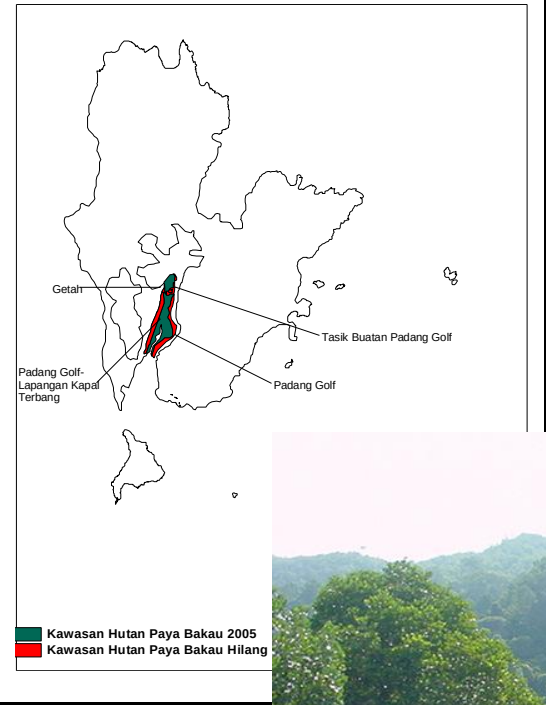
VALUE OF MANGROVES –
ECOTOURISM

Pulau Sibu, Johor



Eco-Educational Forest,
Kuala Sepetang, Perak

Destruction of Mangrove ~ reclaimed for Golf Courses



Abandoned golf course (Pulau Redang, Berjaya Redang Resort) due to shortage of fresh water supply

Buggy path cutting through mangrove

Destruction of the Mangrove ~ Agriculture

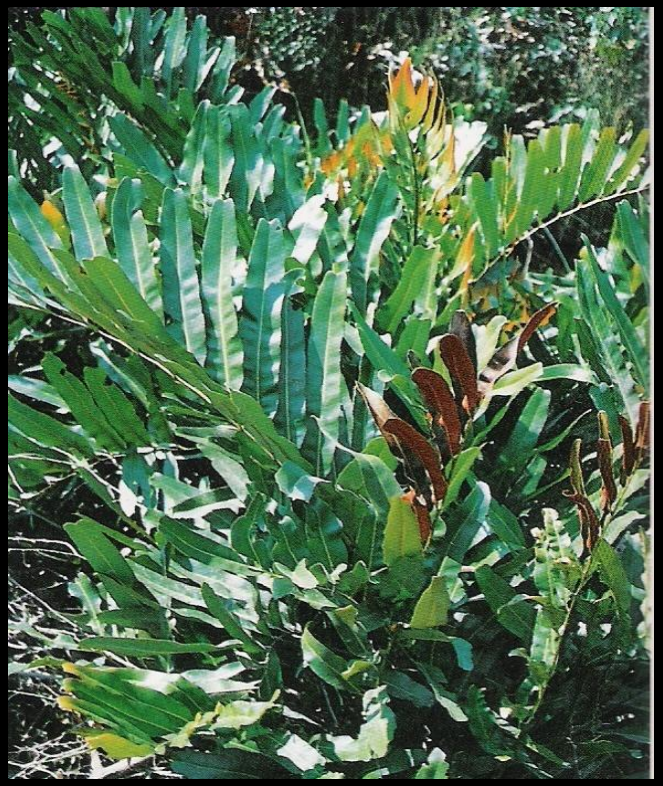
Bujang River, Kedah

Destruction of the Mangrove ~ Aquaculture

Prawn ponds, Sungai Dedap, Kedah

White spot disease in Tiger prawn (*Paneaus monodon*)

Weed Invasion-Piai raya (*Acrostichum aureum*)



Destruction of the Mangrove ~ Housing / Development

- Land reclamation
- Jetty / port

Lapangan Terbang Antarabangsa
Pulau Pinang

Oil & Mangrove DON'T MIX!

Mangrove coverage in Pulau Pinang
40 km^2 (1960) – 15 km^2 (2000)

Lost ~60%

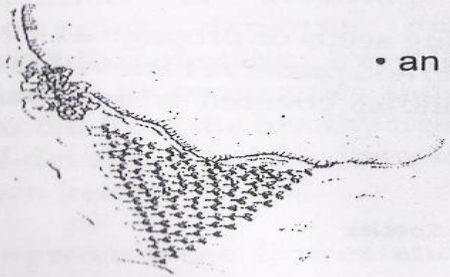
REPLANTING – HIGH FAILING RATE!

- Many post-tsunami planting efforts failed (<10% success rate, IUCN, 2006).
- Mangrove restoration project at the Penang tsunami-impacted site near Sungai Burung had successful rate < 5%.
- Importance of replanting the right species at the right place.

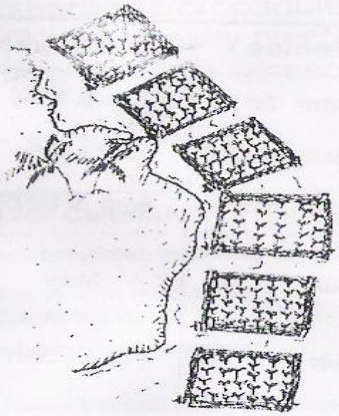
MANGROVE RESTORATION – CHOICES OF SPECIES

Ideas That Can Be Used in Planting

(modified from Melana et. al. 2000)

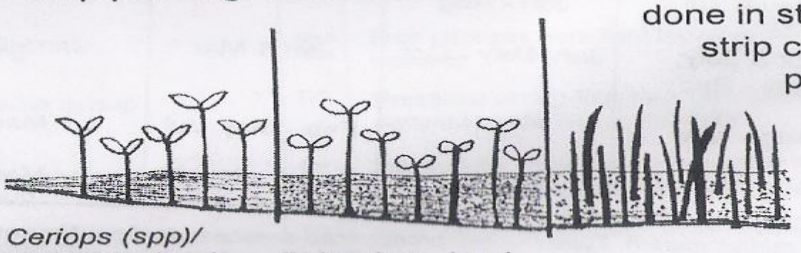


- an inverted V shape with the point of the V facing the sea to deflect wave impact
- triangle formation, with one of the corners of the triangle pointing seaward



- cluster planting. The entire project site is divided into blocks (e.g., 10m x 10m), with each block assigned to an individual. Distance between blocks is also set (e.g., 10m).

- strip planting. With known substrate distribution, planting is done in strips, with each strip corresponding to a particular species.



Ceriops (spp)/ Bruguiera (spp)
reached highest high tide
(clay)

Rhizophora (spp)
With sea water half of the time
(silt/mud/sand)

Avicennia (spp)/ Sonneratia (spp)
Hard substrate w/ thin layer of mud/sand

Site Selection

- Type of substrate. (mud,rocky/coralline,sandy or muck)
- Current species present.
- Presence / absence of seagrass.
- Tidal Height.
- Extent of wave action.
- Presence / absence of pests.
- Historical users of the area.

What you can do?

- Alert authorities when come across mangrove forest clearing : MPPP website (*aduan.**mppp**.gov.my/**complaint**_eng.html)*Jabatan Alam Sekitar, Jabatan Perhutanan Pulau Pinang, MNS, media (newspaper).
- Take photos and record down the location, time & date.
- Tell your friends about the importance of mangrove.


Thank You