

## **Post-tsunami events in Malaysia: intensified R&D in mangrove establishment for coastal protection**

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## **Outline of presentation**

- The scenario of mangrove in P. Malaysia
- The extent of damage by December 2004 tsunami in Peninsular Malaysia and lesson learned;
- Post-tsunami action plans;
- Challenges in R&D in establishing mangroves for coastal protection; and
- Conclusion

### **Scenario of mangroves in P. Malaysia: accreting shoreline by mangrove species**



### **Scenario of mangroves in P. Malaysia: eroding shoreline & big trees are being washed away**







Another scenario: extensive mudflat but without mangrove vegetation



Planting of mangroves in exposed tidal mudflat



Seedlings survive better if they are protected



### Trees directly exposed to tidal waves



### Abrasive action of tidal waves



### Most of the planting activities done in sheltered mangroves for production purposes



### The tsunami hit: December 2004 tsunami



## Post-tsunami action plans

- The government allocated funding for mangrove rehabilitation;
- Existing mangroves will be protected;
- National Committee, assisted by two technical committees (Planning & Implementation Committee and Research & Development Committee) were formed

## Technical Committee on Planning & Implementation

- To identify suitable areas for planting mangroves with the main objective is to increase the acreage under mangrove
- To raise enough planting materials
- To carry out planting

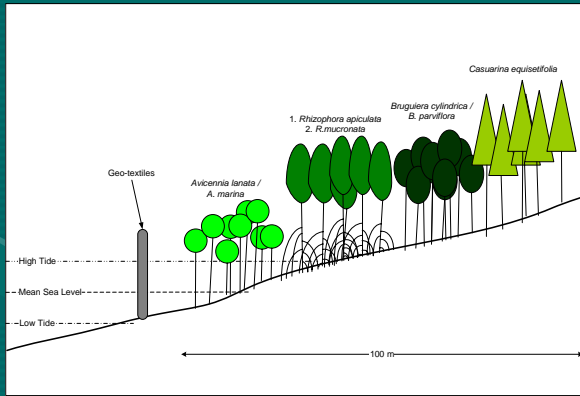
## Technical committee on R&D

- To conduct R&D on planting mangroves for protective purposes (Bio-shield) in coastal areas exposed to tidal actions;
- Strategy used is a combination of hard & soft structure;
- The model established that can be replicated in other areas

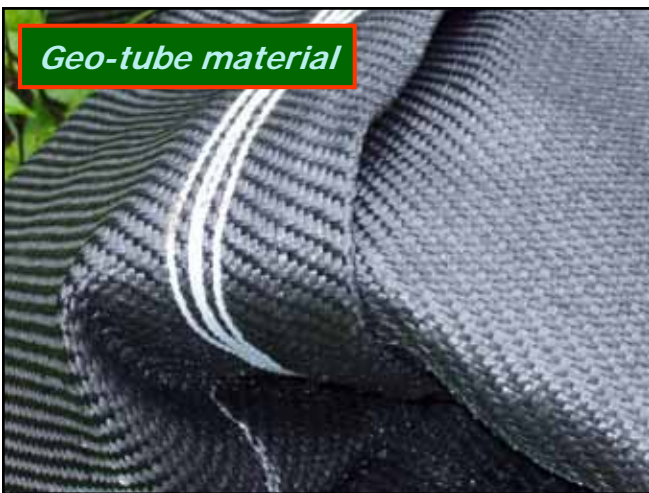
## Challenges of R&D

- To plant mangrove that will act as a buffer zone to protect coastal lines against tidal waves;
- The small seedlings of mangroves need to be protected before they can grow and establish on the mudflat; and
- A planting technique in liquid mudflat needs to be modified/improved
- Insect & diseases

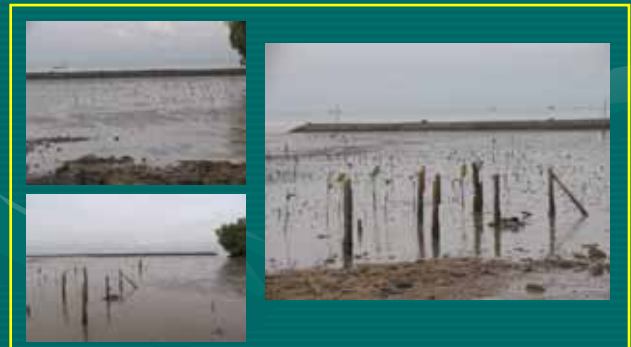
## Planting techniques



## Geo-tube material



## Geo-tube



**Alternative measure to protect coastal line**



**Interlocking concrete slabs**



**Wooden wall & pole**



**PLANTING OF MANGROVES BEHIND A BARRICADE OF DISUSED TYRES**



## INSTALLATION OF WAVE BREAKERS, 1999



Faschines



Coir rolls



Trapped beach materials



Eco-bags

## PREPARATION OF VEGETATED COIR ROLL, 1999



1 year



1 m tall seedlings

## RESULTS: PLOT IA – Opposite site office & laboratory



2000



March 2004

## Conclusion

- To establish a successful model of hard and soft structure (bio-shield) in reducing impacts of tidal waves



**THANK YOU**

