

Demonstration time series

➔ The coastline was eroding 10 meters per year

➔ The earthen dyke was washed away in 2006, 2007, 2008

➔ Houses damaged, crops, mango trees and fish were killed by the sea water



The demonstration was set up in 2009



Reducing wave energy

Natural mangrove forests

Reduce wave energy by 50 - 67 %



Wave break fences

Reduce wave energy by 65 %

The fences:

- ▶ Reverse erosion – allows deposition of silt
- ▶ Promote natural regeneration
- ▶ Increase biodiversity
- ▶ Reduce wave energy
- ▶ Stop silt and rubbish from smothering seedlings
- ▶ Stop silt from retreating to sea



Protection fences increase biodiversity



Avicennia is an excellent colonizing species

Naturally regenerated seedlings grow faster than planted ones!

In open areas the root system develops to cover double the area of the crown.

Two seedlings planted in July 2009.



Rhizophora

Avicennia

After 3 years *Avicennia* is:

- ▶ Over 3 m high
- ▶ Has crown diameter of 1.5 m
- ▶ Root system occupies 1 - 3 m diameter
- ▶ Stem **is** flexible and **not** damaged by waves

After 3 years *Rhizophora* is:

- ▶ 1 m high
- ▶ Has crown diameter of 50 cm
- ▶ Root system occupies 5 - 10 cm
- ▶ Stem is **not** flexible and **is** damaged by waves

Measured change due to mangrove protection fences

EROSION IS REVERSED!

	Treatment 5 Control DARD Fence	Treatment 1 Wave break fence	Treatment 2 Wave break + silt trap fence	Treatment 3 Mangrove + 1 side fences	Treatment 4 Mangrove + 2 side fences
Annual silt gain (cm)		0	4	10	9
Survival planted mangroves (%)	None	30%	90%	100%	100%
Recruitment	None	After 2 years low number. Now (3 years) 1 – 5 seedlings m ²	After 1 year medium number. Now 20 – 500 m ² .	Immediate, medium numbers. Now outgrowing planted seedlings	Immediate – large numbers. Now outcompeting planted seedlings
Benthos – Species richness (Can Tho Uni)	4	3	7	5	5
Benthos – species abundance (Molluscs & Crustacea) (Can Tho Uni)	6	51	57	86	45

Fences allow change to mud structure

Mud collected at low tide on the same day

No fence



One fence



Two fences



Mangrove + fence



Natural mangrove

