Restoring degraded coastal mangrove areas in Banten Bay Indonesia using sediment trap

Main Topics :

- Green Belt of coastal and river banks policies
- Functions and Threats
- Community Involvement in Restoration
- Protecting the Reserve's coastal areas using simple technology
- Sylvo-fishery behind the reserve and ecotourism
- Conclusion and suggestion

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International Conference on Sustainable Mangrove Ecosystems:
Managing a vital resource for achieving the SDGs and the Paris Agreement
18-21 April 2017, Inna Grand Bali Beach Hotel, Bali, Indonesia

Green Belt of coastal and river banks : Policies

- DG Fishery Decree No H.I/4/2/18/1975, green belt is 400 m from the lowest tide toward inland;
- DG Forestry Decree No 60/Kpts/DJ/I//1978, green belt is 50 m from lowest tides and 10 m from river banks.
- Joint Decree between MoF & MoA No. KB 550/246/Kpts/1984 & 082/kPTS-II/1984, green belt width is 200m along the beach and the remaing mangroves in Java not allowed to be logged. And all mangrove in small islands (< 1000 ha) must be conserved.
- Presidential Decree No 32/1990, coastal green belt width 130 x the difference of max tidal range toward inland; big river 100 m; small river 50 m in each bank.
- Presidential Regulation No 73/2012 (National Strategy on Mangrove Ecosystem Management)
- National commitment in reducing 29% GHG emission by 2030

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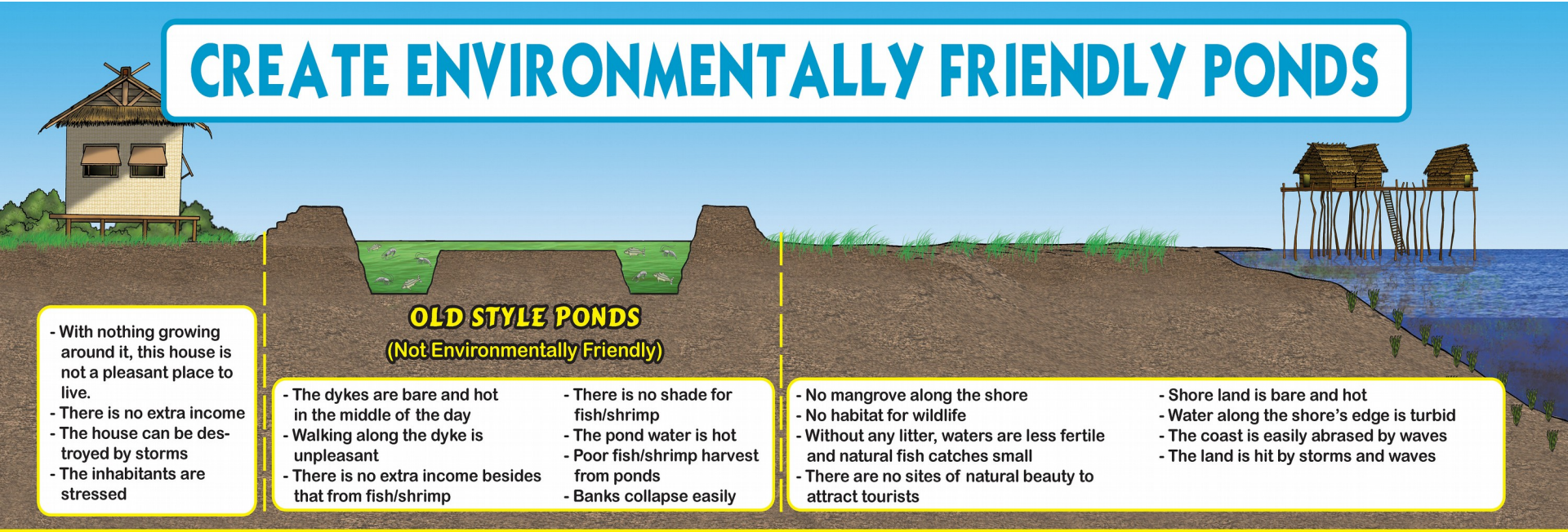
CREATE ENVIRONMENTALLY FRIENDLY PONDS

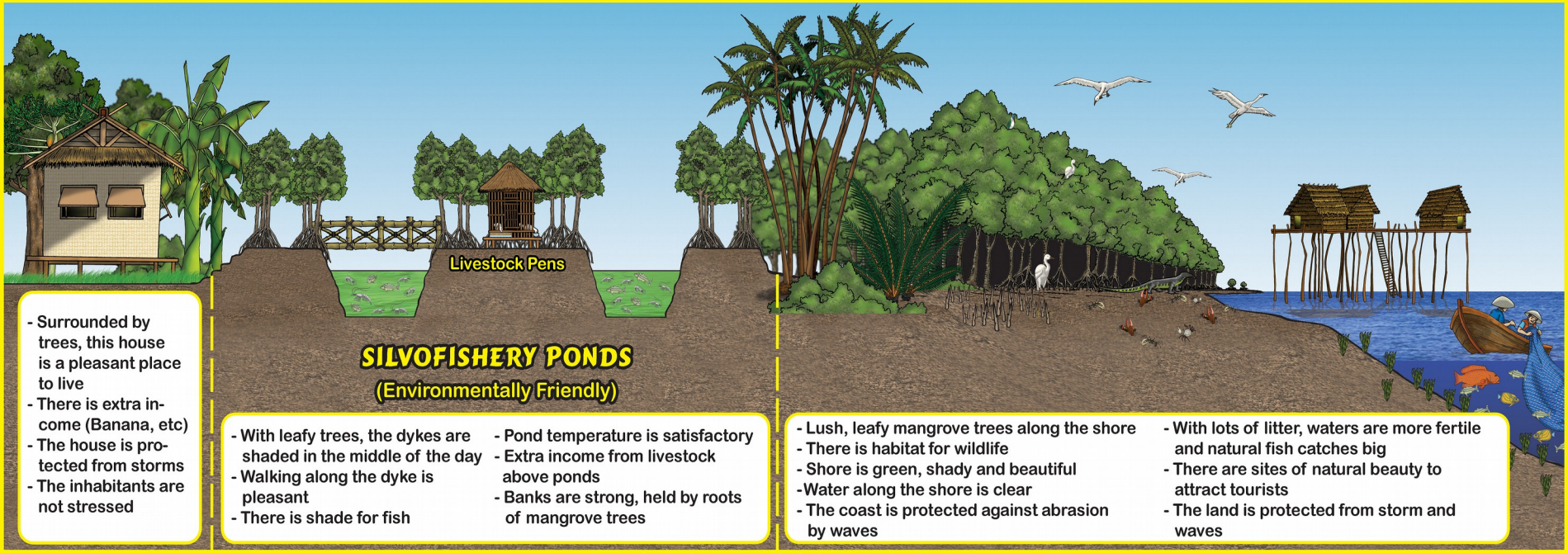


- With nothing growing around it, this house is not a pleasant place to live.
- There is no extra income
- The house can be destroyed by storms
- The inhabitants are stressed

OLD STYLE PONDS
(Not Environmentally Friendly)

- The dykes are bare and hot in the middle of the day
- Walking along the dyke is unpleasant
- There is no extra income besides that from fish/shrimp
- There is no shade for fish/shrimp
- The pond water is hot
- Poor fish/shrimp harvest from ponds
- Banks collapse easily

- No mangrove along the shore
- No habitat for wildlife
- Without any litter, waters are less fertile and natural fish catches small
- There are no sites of natural beauty to attract tourists
- Shore land is bare and hot
- Water along the shore's edge is turbid
- The coast is easily abrased by waves
- The land is hit by storms and waves



- Surrounded by trees, this house is a pleasant place to live
- There is extra income (Banana, etc)
- The house is protected from storms
- The inhabitants are not stressed

SILVOFISHERY PONDS
(Environmentally Friendly)

- With leafy trees, the dykes are shaded in the middle of the day
- Walking along the dyke is pleasant
- There is shade for fish
- Pond temperature is satisfactory
- Extra income from livestock above ponds
- Banks are strong, held by roots of mangrove trees

- Lush, leafy mangrove trees along the shore
- There is habitat for wildlife
- Shore is green, shady and beautiful
- Water along the shore is clear
- The coast is protected against abrasion by waves
- With lots of litter, waters are more fertile and natural fish catches big
- There are sites of natural beauty to attract tourists
- The land is protected from storm and waves

Illustration: Eri & Aldo, Computer Graphics: Oka, Design: Aldo (aware_design@yahoo.com)

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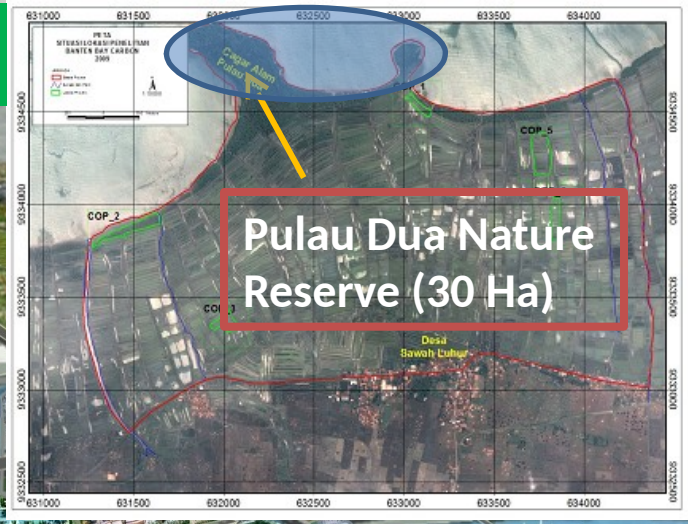
UNEP

Green Coast
For **nature** and **people**
after the tsunami

Financed by: Oxfam Novib

Banten Bay Conservation & Development



500 Ha degraded mangrove-pond areas will potentially sequester 511,500 ton carbon Or 1,877,205 ton CO2 if restored

CA Pulau Dua (30 Ha)

Eroded part of Pulau Dua

Banten Waterfront City

Water Front City is under planning by the Serang Municipality

Reserve Functions

- Habitat and feeding ground of water birds (including migratory species)
- Support biodiversity
- Protect fish ponds and villages behind the reserve
- Water filtration before entering ponds
- Carbon storage
- Research, Ecotourism, etc

Pulau Dua Reserve under Threats

- **Abrasion – due to strong sea wave in the eastern part of the Reserve**
  - ✓ Around 2 m eroded within 5 years (@ Noor, 2004);
  - ✓ Many of mangrove trees (Avicennia sp) uprooted
  - ✓ Birding population decrease (@ Noor 2004)

How to compensate the eroded part of the reserve ?
Create land accretion using simple technology with community participation in other part of the reserve

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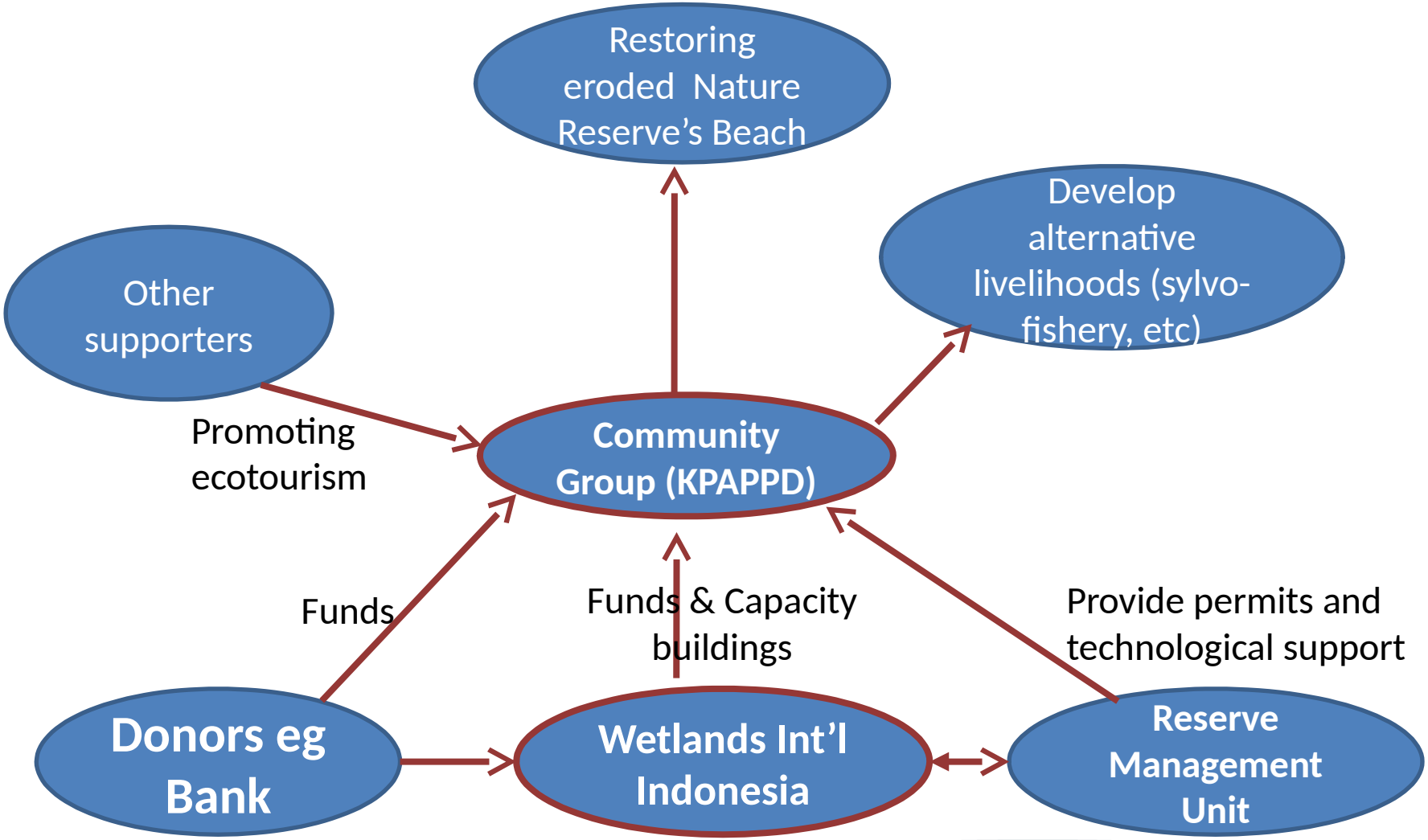
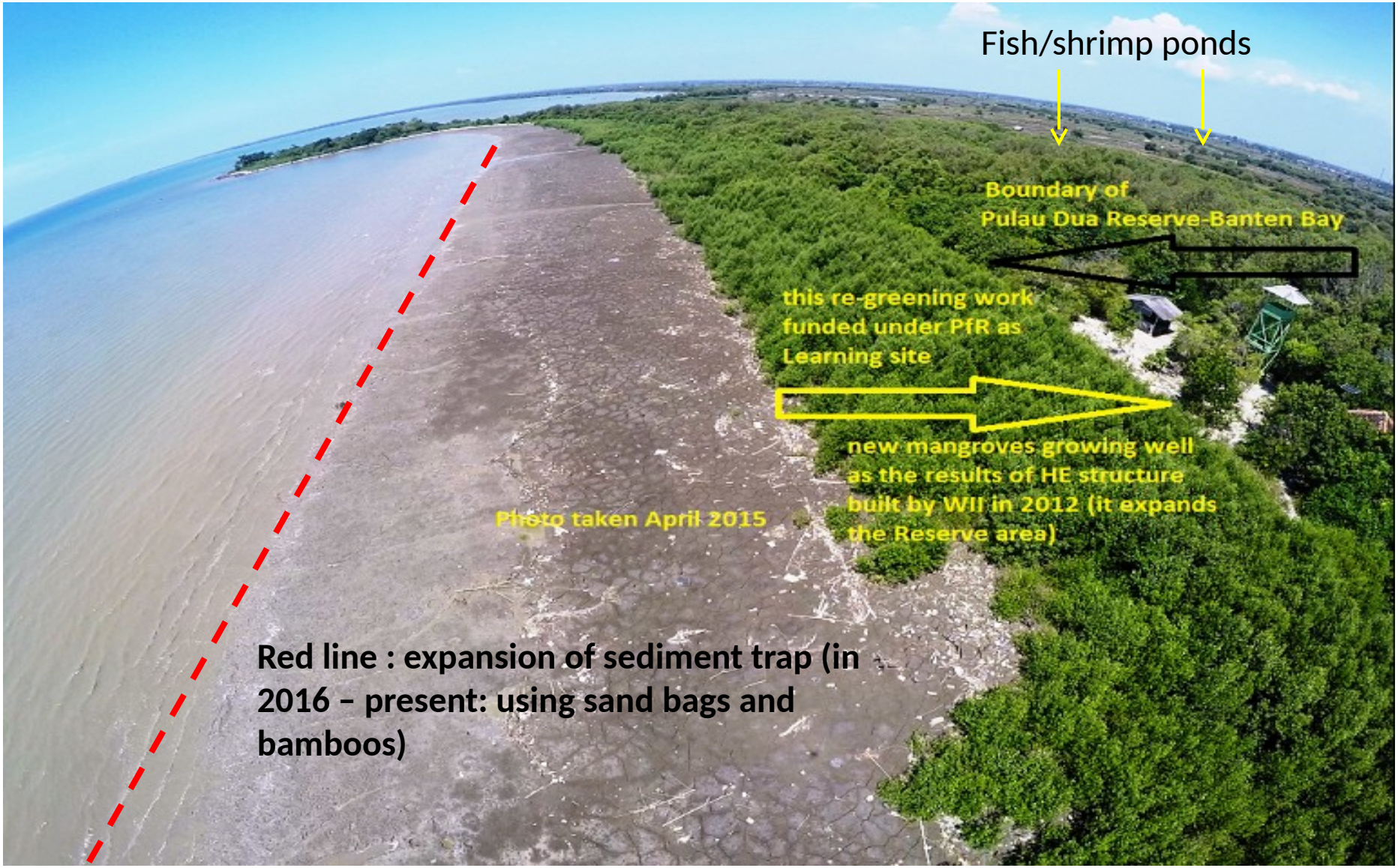
Community Involvement in Restoration Programme combined with livelihood development in Banten Bay



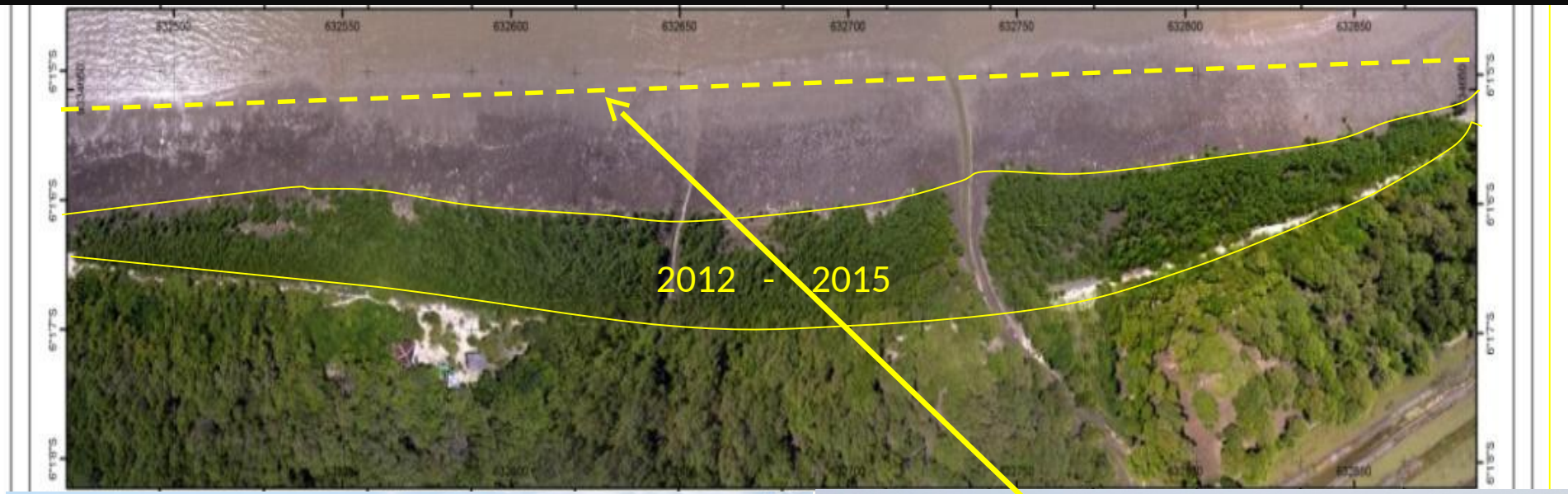
Protecting the Reserve's beaches using simple technology, carried out by local community

Aerial picture (using drone, taken in April 2015)

New mangroves grew naturally and expand the reserve area



35,000 Avicennia sp grown (0.5 – 5 mt tall) within 0.9 Ha accreting land and stored 127 ton soil carbon (sediment depth up to 4 m) and 48 ton C in the trees (Tyas Ayu Lestari, 2015)



Sylvo-fishery ponds applied behind the Pulu Dua Nature Reserve (Photo below taken in April 2015)

Other Sediment trap applied by WII in Talibura- Kab Sikka (Flores, 2013), using bamboos, coconut trunks and leaves and old fish nets

- Sediment trap structures also trapped fishes
- Coastal villagers harvesting fishes within the trapped sediment compartment

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Sediment trap applied in Demak – Central Java (2012 – on going)

Involved women in its preparation works

CONCLUSIONS & SUGGESTIONS

- Trapping sediment on moderate eroded coastal areas, using simple and cheap technology (e.g. old fish nets, sand bags, bamboo poles) seem very possible.
- Involving local community from beginning of this work will help the success of the works
- The trapping should be made step by step, and at first should start close to the eroded coast line, and then extended when the previous new sediment has established and stabile
- The trapped sediment, can act as new mangrove habitat and can support the mangroves to grow naturally (no need to plant the seedlings, as far as nearby the trapped area, mature mangrove trees area available)
- In Banten bay, within 4 years, the trapped sediment has created about 0.9 ha new habitat for about 35,000 mangrove (Avicennia sp) to naturally grow; it stored 127 ton soil carbon (sediment depth up to 4 m) and 48 ton C in the trees (Tyas Ayu Lestari, 2015)

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Thank you
Terima Kasih

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