Mangrove Restoration
GIZ Kien Giang Project
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I- Characteristics of Kien Giang

- Located in the West of the Mekong Delta;
- Total land area: 634,613ha;
- 143 islands;
- Coastal line: 200 km;
- Forest land: 85,780 ha;
- Flat plain (0.8-1.5 m asl);
- Severe inundation under predicted sea level rising;
Kien Giang Biosphere Reserve

Total area 1,118,105 ha
- Core zone 36,935 ha
- Buffer zone 172,578 ha
- Transition zone 978,591 ha
Kien Giang Biosphere Reserve

Key area:

U Minh Thuong National Park
- one of last significant areas peat swamp forest;
- Had a certificate on Asian Heritage by MONRE;

Phu Quoc National Park
- Dipterocarpus forests;
- Rare mangrove with Lumnitzera located along the Rach Tram river;
- Important sea grass beds and coral reefs;

Kien Luong Natural Reserve and Mangroves
- Karst areas and limestone forest with high biodiversity;
- Mangrove forest;
Mangrove forest

• Approximately 5,430 hectares of mangrove distributed in 70% of coastline in An Minh, An Biên, Hon Dat, Kien Luong, Ha Tien district and Phu Quoc island;

• 27 species of mangrove with Lumnitzera littorea in Vietnamese Red Book in 2007;

• Biomass and Carbon in mangrove are high (1 mil tone CO₂ equivalent);
II- Challenges by climate change

- 65% of area flooded if seawater rises up to 1m;
- Coastal line severely eroded;
- Coastal zone under threat by salinization;
II- Challenges by climate change

A large portion of the coastal line of Kien Giang is exposed to Southwesterly winds during the wet season.
Heavy eroding in Vam Ray area
Dyke eroded, community activities badly effected

Sea water intrusion killed the crops and trees
Erosion and strong wave in the wet season leaded to the failure of mangrove planting in the past
III- Mangrove restoration by GIZ Kien Giang

The demonstration model in Hon Dat

- The nursery is set under mangrove canopy;
- Melaleuca fences is built to trap silt and prevent strong wave;
- Planting mangrove;
- Using more species of mangrove to increase biodiversity;
III- Mangrove restoration

The nursery

- More than 10 species of mangrove grown;
- Producing seedling in plastic bags and putting under the mangrove canopy (thinning mangrove to get sunlight);
- The tide will water seedlings naturally;
- Making fence to protect the nursery;
III- Mangrove restoration

Melaleuca fences

- Reducing wave energy;
- Decreasing erosion, encourage deposition;
- Preventing rubbish, protecting seedlings inside the fence;
- Supporting the natural regeneration;
III- Mangrove restoration

Treatments

- Single Wave Break Fence
- Wave Break and Silt Trap Fences
- Behind Mangroves and 1 Side Fence
- Behind Mangroves and 2 Side Fences
- Control (DARD Fence)
- Wave Break Fence
- Silt Trap Fence
- Side Fence
- Concrete Dyke
- Walkway
A recent study of wave energy attenuation showed that the double fence combination is as effective as mangrove forest in reducing wave energy.

- Mangrove belt reduces 50-67% of wave energy.
- Wave break fence reduces 65% of energy.
III- Mangrove restoration

Monitoring sediment accumulation and stabilization

Legend
- Behind wave break fence
- Behind silt trap fence
- Behind one side fence
- Behind two side fences
- Control

Average sediment accumulation per treatment over 1 year
III- Mangrove restoration

Fences and planting increase Biodiversity

Benthos density in treatments and natural mangrove forest in the Hon Dat demonstration site, Kien Giang
III- Mangrove restoration

Monitoring growth of some species of mangrove

Growth of some mangrove species planted behind fence area

Height (cm)

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<th>Time</th>
<th>Duration</th>
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<tr>
<td>Dec 2010</td>
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- Đướyc (Rhizophora apiculata)
- Cóc dờ (Lumnitzera littorea)
- Cóc trắng (Lumnitzera racemosa)
- Suối (Xylocarpus granatum)
- Mắm trắng (Avicennia alba)
III- Mangrove restoration

Regeneration

2 December 2010

28 October 2011

Control zone
No signs of natural recovery.

Behind single fence
Regeneration rate of 500 trees/ha.

Behind double fence
Regeneration rate of 1.100 trees/ha.

(Institute for Climate Change Research, University of Can Tho)
• Using fences at Vam Ray model has restored mangrove belt eroded and biodiversity.

• Using Melaleuca pole, local materials, has encouraged the melaleuca afforestation, raised the forest coverage rate through increasing the value chain for melaleuca.

• Through building fences to restore mangrove, the awareness of local community on forest protection and development are increasing.
III- Mangrove restoration

Expansion

Location: Thu Nam, Nam Thai, An Bien

- 500m of silt trap fence (type 2)
- To restore 5ha of mangrove
- Avicennia
III- Mangrove restoration

Expansion

Location: Xeo Ban – Thu Tam, Thuan Hoa commune, An Minh district

- 2,500m of silt trap fence (type 1) and wave break fence.
- To restore 25ha of mangrove
- Avicennia
Thank you!

Project of Conservation and Development of Kien Giang Biosphere Reserve
www.kiengiangbiospherereserve.com.vn

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