

Financing Biodiversity & Climate Change – thinking outside the Box

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Ecosystem based Adaptation

*sustainable management, conservation & restoration of ecosystems, as part of an overall adaptation strategy that takes into account the multiple social, economic, & cultural co-benefits for local people
(& also includes ecosystem based approaches to Disaster Risk Reduction)*

EbA investments support both Livelihoods & Biodiversity/Conservation – & is vital for both



EBA & Engineered options

EbA – Green Infrastructure

- Restore mangroves
- Replant stream/river buffer zones
- Use of climate smart species (trees, crops) switching species
- Reduce upland logging
- Reduce coral extraction
- Regulate land tenure
- Rezone land use
- Relocate highly vulnerable
- Flood warning systems
- Diversification (more options)
- enhance markets,
- adaptive capacities

Engineered - grey Infrastructure

- Reinforce rivers (gabions)
- Dredge rivers
- Realign rivers
- Increase drainage (roads)
- Improve bridges
- Build sea walls/barriers
- Reclaim land
- Sea dykes & canals
- Elevate infrastructure

Costs of Green-Grey Options

Adaptation options	Unit cost	10 years (Fiji \$)	20 years (Fiji \$s)	Some potential co-benefits
Restore Mangroves	M ²	\$2.76	\$4.67	NTFPs, mitigation
Replant river buffers	M ²	\$2.88	\$4.87	Grazing, mitigation
Increase drainage	M	\$16.29	\$20.00	?
Build sea walls	M	\$1,670.00	\$2,050.00	?
Protect river banks		\$1,144.00	\$1,404.00	?
Dredge rivers	M ³	\$18.52	\$22.72	?
Realign rivers	M	\$923.00	\$1,133	?

EbA options much cheaper & with more co-benefits; but protection effectiveness needs to be taken into account. (Rao, Carruthers et. al 2012, S. Pacific Regional Environmental Programme)

Coastal Forests of Japan – after Tsunami



Investments in Green Infrastructure (forests) protect houses, act as trap & reduces storm energy – investing in protection

Alps – Green Infrastructure Protects & Prevents

- Disasters increasing in magnitude & frequency;
- Pre-disaster conditions determine extent of impact & conditions affected by climate change effects
- Switzerland & avalanche protections-
Forest/Avalanche Interactions



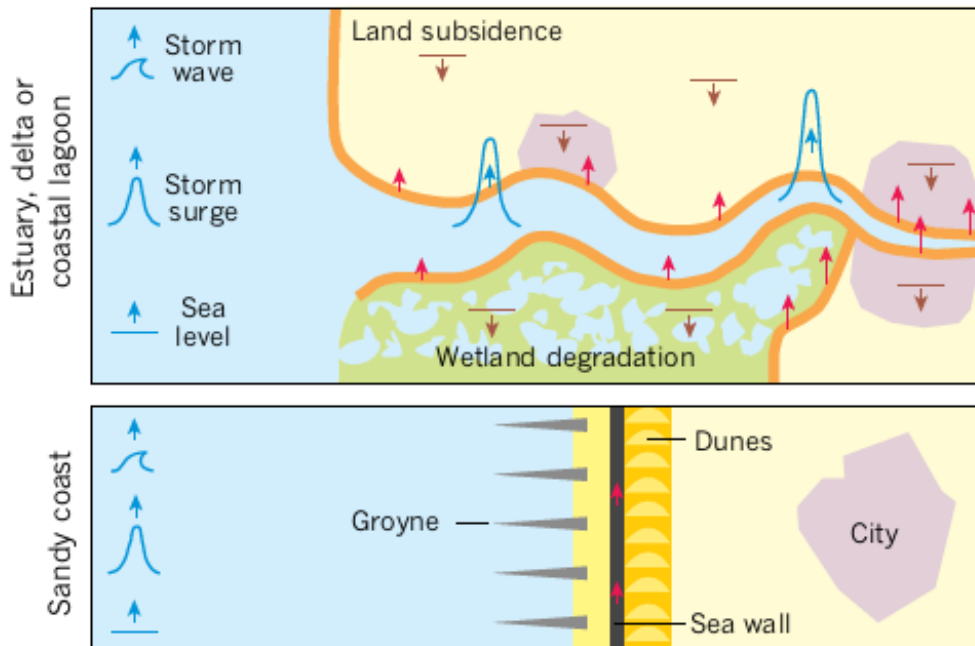
Do We Have an Economic Case for Eco-DRR?

Ecosystem	Hazard	Hazard mitigation value (US\$)
Coral reefs (global)	coastal	189,000 per hectare/year
Coral reefs (Caribbean)	coastal	700,000– 2.2 billion per year (total value)
Coastal wetlands (United States)	hurricane	8,240 per hectare/year
Coastal wetlands (United States)	storms	23.2 billion per year (total value)
Luznice floodplain (Czech Republic)	floods	11,788 per hectare/year
Muthurajawela marsh (Sri Lanka)	flood	5 million per year (total value); 1,750 per hectare/year

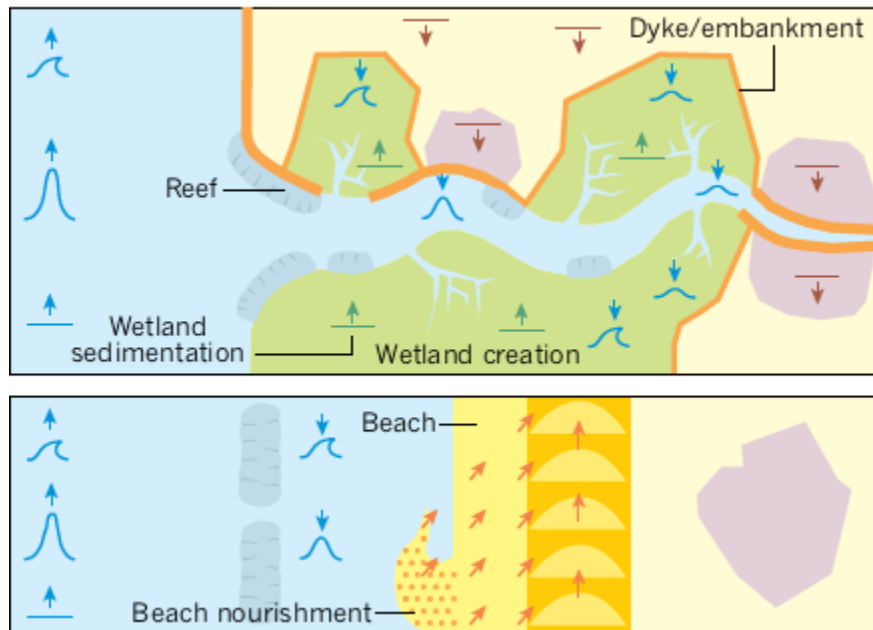


Scheldt Estuary, Belgium – protect more landward, densely populated areas from storm surges, sluice allows daily tidal flooding

Conventional coastal engineering



Ecosystem-based coastal defence



Potential for Ecosystem based + infrastructure flood defences in major cities across the Globe (40% of worlds people live close to coast

Potentials for Innovative Finance

- **Equity** – ex. Of flood prevention infrastructure; Yield \$\$ benefits, but accrue to community & not project.
- **Debt** (micro-finance) support wider array of activities – need economic case of loan finance – e.g. grey-green flood protection; enhancing water supply – (e.g. Mt. Elgon); Grameen & Equity Banks – could expand to support loans for EbA type activities
- **Subsidies** – move from supporting negative (e.g. coal) to positive (e.g. EbA), at least level playing field
- **ODA** – make it more climate smart (additionality), and think about role of nature

Private Sector finance – Some Examples

- Mangrove restoration - conserve/restore mangroves & have well planned shrimp farms (Indonesia)
- Urban Green Infrastructure – use of waste water & organic waste – build urban landscape (roof tops, green walls) & use of earthworms to process. So more efficient use of water for walls & roof tops + cooling effect
- Unilever & tea in Ke, Tz – deforestation reducing tea yields & need to reverse & use natural restoration (FLR) + enhanced irrigation efficiency & rain water harvesting
- Swedish Bank (SEB) green bonds (raised by 2009, \$665 mill) of which 20% specifically for adaptation, which WB uses for loans, e.g.
 - Flood protection (FLR + watershed management)
 - Food security & strong resilient crops
 - Sustainable forest management & avoided deforestation

Conclusions

- **Q1:** As nature & the environment is our foundation – how can we move from assuming to integrating nature in all our CC work in terms of financing?
- **Q2:** How can we get support for micro-finance to deliver on CC based work that take into account & support nature & EbA??

EbA & green/grey options offer a toolbox of approaches that take into account CC (so be climate smart & additional) & can be integrated into different financial instruments to support/improve livelihoods, be good for conservation, & for business