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

<table>
<thead>
<tr>
<th>Adaptation options</th>
<th>Unit cost</th>
<th>10 years (Fiji $)</th>
<th>20 years (Fiji $)</th>
<th>Some potential co-benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restore Mangroves</td>
<td>M²</td>
<td>$2.76</td>
<td>$4.67</td>
<td>NTFPs, mitigation</td>
</tr>
<tr>
<td>Replant river buffers</td>
<td>M²</td>
<td>$2.88</td>
<td>$4.87</td>
<td>Grazing, mitigation</td>
</tr>
<tr>
<td>Increase drainage</td>
<td>M</td>
<td>$16.29</td>
<td>$20.00</td>
<td>?</td>
</tr>
<tr>
<td>Build sea walls</td>
<td>M</td>
<td>$1,670.00</td>
<td>$2,050.00</td>
<td>?</td>
</tr>
<tr>
<td>Protect river banks</td>
<td>M</td>
<td>$1,144.00</td>
<td>$1,404.00</td>
<td>?</td>
</tr>
<tr>
<td>Dredge rivers</td>
<td>M³</td>
<td>$18.52</td>
<td>$22.72</td>
<td>?</td>
</tr>
<tr>
<td>Realign rivers</td>
<td>M</td>
<td>$923.00</td>
<td>$1,133</td>
<td>?</td>
</tr>
</tbody>
</table>

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?

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

(PEDRR 2011)
Scheldt Estuary, Belgium – protect more landward, densely populated areas from storm surges, sluice allows daily tidal flooding
Potential for ecosystem-based and infrastructure flood defences in major cities across the Globe (40% of world's people live close to the 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**