Poverty Reduction and Biodiversity Conservation: An Economic Perspective

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Ecosystem Losses & Links to MDG’s
Haiti Example: MDG # 1, 4, 5, 8…
Haiti : Ecosystem Losses and Links to MDG’s 1, 4, 5, 8…

- Haiti was originally fully forested, less than 3% cover still remains. Poorest country in the Western Hemisphere 65% of its people must survive on less than 1 $ a day.

- Deforestation has diminished evaporation back to the atmosphere over Haiti; rainfall in many locations has declined by as much as 40%, reducing stream flow and irrigation capacity.

- 1950-1990, the amount of arable land almost halved due to soil erosion.

- Avezac Irrigation System only supports half of the initially 9,500 acres it planned to cover.

- When it rains, hillsides no longer efficiently retain or filter water and even moderate rains cause devastating floods.

- Ground and stream waters are laden with sediment and pollution which has degraded estuarine and coastal ecosystems.

- About 90% of Haitian children are chronically infected with intestinal parasites that they acquire from the water they drink.
MDG 3: Example from India

Box 2.3: Gender, poverty and biodiversity in Orissa, India

The impact of the loss of biodiversity, often not very visible, has serious implications for poverty reduction and well-being for women as it severely affects the role of women as forest gatherers. Studies in the tribal regions of Orissa and Chattisgarh, states in India which were once heavily forested, have recorded how deforestation has resulted in loss of livelihoods, in women having to walk four times the distance to collect forest produce and in their inability to access medicinal herbs which have been depleted. This loss reduces income, increases drudgery and affects physical health. There is also evidence to show that the relative status of women within the family is higher in well-forested villages, where their contribution to the household income is greater than in villages that lack natural resources.

Sarojini Thakur, Head of Gender Section, Commonwealth Secretariat, personal communication, May 15th 2008.
India Example: 480 Million people earn their livelihood mainly in small farming, animal husbandry, informal forestry, fisheries …

Ecosystem services / classical GDP

7.3 %

Ecosystem services / “GDP of the Poor”

57 %

Source: GIST’s Green Accounting for Indian States Project, 2002-03 data
How do we identify who are the rural poor?

- Agriculture - Main workers
  - Cultivators - 103 million - of which less than 1 ha holdings 60%
- Agricultural labourers - 63 million - all considered poor
- Agriculture - Marginal workers - all considered poor
  - Cultivators - 24 million
  - Agricultural labourers - 43 million
- Fishing, hunting, plantation and other activities - 10.3 million (as per census 2001) but studies vary in their estimates
- Forest dependent population (from FAO study) - 275 million
- Total - 477 million (approx)
Rethinking Agricultural Modernization: Looking at the full suite of ecosystem services for informed choices

Analysis of local wetland benefits to justify traditional tank management in Sri Lankan river basin: value of rice is but a fraction of all benefits

The Value of Tank Water and Biological Resources in Rajangana and Angamauwa Sub-Catchments of the Kala Oya Basin (per tank)

<table>
<thead>
<tr>
<th>Resource</th>
<th>% of households</th>
<th>Value per Household (US$/hh/yr)</th>
<th>Value per Unit Area* (US$/ha/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paddy cultivation</td>
<td>13%</td>
<td>177</td>
<td>161</td>
</tr>
<tr>
<td>Vegetable cultivation</td>
<td>7%</td>
<td>86</td>
<td>39</td>
</tr>
<tr>
<td>Banana cultivation</td>
<td>3%</td>
<td>1150</td>
<td>209</td>
</tr>
<tr>
<td>Coconut cultivation</td>
<td>13%</td>
<td>238</td>
<td>246</td>
</tr>
<tr>
<td>Domestic water</td>
<td>93%</td>
<td>226</td>
<td>1,469</td>
</tr>
<tr>
<td>Livestock water</td>
<td>13%</td>
<td>369</td>
<td>335</td>
</tr>
<tr>
<td>Commercial water</td>
<td>2%</td>
<td>132</td>
<td>12</td>
</tr>
<tr>
<td>Fishery</td>
<td>16%</td>
<td>309</td>
<td>351</td>
</tr>
<tr>
<td>Lotus flowers</td>
<td>10%</td>
<td>106</td>
<td>72</td>
</tr>
<tr>
<td>Lotus roots</td>
<td>7%</td>
<td>235</td>
<td>107</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>2,972</strong></td>
<td></td>
</tr>
</tbody>
</table>

* Total inundated area
### The Economics of Ecosystems & Biodiversity

#### Leuser Ecosystem, Indonesia

Distribution of benefits to the different sectors (in million US$)

<table>
<thead>
<tr>
<th></th>
<th>Deforestation</th>
<th>Conservation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Value</td>
<td>Proportion (%)</td>
</tr>
<tr>
<td>Biodiversity (WTP)</td>
<td>56</td>
<td>1</td>
</tr>
<tr>
<td><strong>Provisioning Services</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>2499</td>
<td>36</td>
</tr>
<tr>
<td>Fisheries</td>
<td>557</td>
<td>8</td>
</tr>
<tr>
<td>NTFP</td>
<td>235</td>
<td>3</td>
</tr>
<tr>
<td>Timber</td>
<td>1184</td>
<td>17</td>
</tr>
<tr>
<td>Water supply</td>
<td>699</td>
<td>10</td>
</tr>
<tr>
<td><strong>Regulating Services</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flood prevention</td>
<td>1223</td>
<td>18</td>
</tr>
<tr>
<td>Fire prevention</td>
<td>30</td>
<td>0</td>
</tr>
<tr>
<td>Carbon sequestration</td>
<td>53</td>
<td>1</td>
</tr>
<tr>
<td><strong>Cultural Services</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tourism</td>
<td>171</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>6958</td>
<td>100</td>
</tr>
</tbody>
</table>

*Note:* for the period 2000–2030, at a discount rate of 4%.
Making the case: Unequal distribution of ecosystem benefits

Distribution of benefits under different land use scenarios in the Leuser National Park, Indonesia
(in million US$ over a period of 30 years, 4% discount rate)

Local community “best option”

Logging industry “best option”

Source: adapted from van Beukering et al. 2003
Who benefits from Panda tourism in Wolong BR? (He et al 2008)

Wolong BR
- conserves global public goods (e.g. giant panda),
- ensures collective goods at national/local level (e.g. panda tourism)
- restricts access to other local collective and private goods (NTFPs, farmland inside the PA).

But check benefit distribution:
Those living close to the roads had a larger share in tourism related income, whereas those living in the forest – in panda habitat – continued to largely rely on agriculture for their living.

ES perspective allows to target/fine tune conservation measures!
Way forward


We need to diversify conservation action in two ways:

- towards a mosaic of areas with different land use rules inside and outside protected areas
- towards recognised and strengthened in situ management capacities and institutional arrangements
- towards a mosaic of areas with different land use rules inside and outside protected areas:

Land use modelling by Polasky et al (2005):

“ We combine the biological and economic models with optimization methods to find efficient land-use patterns …..

….. we find that a large fraction of conservation objectives can be achieved at little cost to the economic bottom line with thoughtful land-use planning.”
- towards recognized and strengthened in situ management capacities and institutional arrangements

Hayes and Ostrom 2005, comparing state run PAs with other forest management regimes (p 607)

Hayes (2006):
“…. rather than a legal definition of protection, it is the rules acknowledged and made by forest users that influence forest condition.”
Thank You!

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