Ecosystem Services of Mangrove Forests

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What are Mangroves?

- A plant community that has adapted to live in the inter tidal zone in the coastal zone.
- Mangroves have special adaptations against the hard environmental conditions.
- One of the most highly productive ecosystem
Where can they be found?

- Along the shoreline of river estuaries and lagoons.
- Kala Oya estuary, Batticaloa lagoon, Puttalum lagoon harbors rich mangrove community.
Mangrove Forests of Sri Lanka

Total mangrove cover
12,000 ha – CCD 1985
8,687 ha - Legg and Jewell, 1995

About 0.1- 0.2 % of the total land area

Gap analysis of Sri Lanka Jayasuriya et al. 2006
Ecological Services of Mangroves

- Flood control
- Groundwater refill
- Shoreline stabilization & storm protection
- Sediment & nutrient retention and export
- Water purification
- Reservoirs of biodiversity
- Cultural values
- Recreation & tourism
- Climate change mitigation and adaptation
Ecological Services of Mangroves

- Wetland products
- Fish and other fishery
- Provide fuel wood and building material
- Coloration of fishing nets
Focus: Ecosystem Services

The benefits people obtain from ecosystems

ECOSYSTEM SERVICES

Provisioning
- Food
- Freshwater
- Wood and fiber
- Fuel
- ...

Supporting
- Nutrient cycling
- Soil formation
- Primary production
- ...

Regulating
- Climate regulation
- Flood regulation
- Disease regulation
- Water purification
- ...

Cultural
- Aesthetic
- Spiritual
- Educational
- Recreational
- ...

The Millennium Ecosystem Assessment (MA) 2001
Focus: Consequences of Ecosystem Change for Human Well-being
MA Framework

Human Well-being and Poverty Reduction
- Basic material for a good life
- Health
- Good Social Relations
- Security
- Freedom of choice and action

Indirect Drivers of Change
- Demographic
- Economic *(globalization, trade, market and policy framework)*
- Sociopolitical *(governance and institutional framework)*
- Science and Technology
- Cultural and Religious

Direct Drivers of Change
- Changes in land use
- Species introduction or removal
- Technology adaptation and use
- External inputs *(e.g., irrigation)*
- Resource consumption
- Climate change
- Natural physical and biological drivers *(e.g., volcanoes)*

Ecosystem Services
<table>
<thead>
<tr>
<th>Economic Benefit</th>
<th>Valve (Rs million/Yr)</th>
</tr>
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<tbody>
<tr>
<td>Flood control</td>
<td>485.51</td>
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<tr>
<td>Industrial wastewater treatment</td>
<td>162.31</td>
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<tr>
<td>Agricultural production</td>
<td>30.29</td>
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<tr>
<td>Support for downstream fisheries</td>
<td>20.00</td>
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<td>Firewood</td>
<td>7.96</td>
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<tr>
<td>Fishing</td>
<td>6.26</td>
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<td>Recreation</td>
<td>5.28</td>
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<tr>
<td>Domestic sewage treatment</td>
<td>4.32</td>
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<td>Freshwater supply for local people</td>
<td>3.78</td>
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<tr>
<td>Carbon sequestration</td>
<td>0.78</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>726.49</strong></td>
</tr>
</tbody>
</table>

Emerton & Kekulandala, 2003
Threats to Mangroves

- Prawn Farming
- Reclamations
- Burning & Cutting
- Garbage dumping
- Shore line erosion