What is the Ecosystem approach?
What is this?

A water treatment plant
A flood control system
Carbon sink
Water supply
A pollinator
An asset for tourism
Coastal Protection
Fish nursery

More than resources; → Systems
More than beasts and bugs; --> Services
(g) Take into account the ecosystem approach;

(h) Highlight the contribution of biodiversity, including, as appropriate, ecosystem services, to poverty eradication, national development and human well-being, as well as the economic, social, cultural, and other values of biodiversity as emphasized in the Convention on Biological Diversity, making use, as appropriate, of the methodologies and conceptual framework of the Millennium Ecosystem Assessment;

(i) Identify the main threats to biodiversity, including direct and indirect drivers of biodiversity change, and include actions for addressing the identified threats;
15 of 24 ecosystem services are in decline

<table>
<thead>
<tr>
<th>Provisioning Services</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Food</strong></td>
<td></td>
</tr>
<tr>
<td>crops</td>
<td>↑</td>
</tr>
<tr>
<td>livestock</td>
<td>↑</td>
</tr>
<tr>
<td>capture fisheries</td>
<td>↓</td>
</tr>
<tr>
<td>aquaculture</td>
<td>↑</td>
</tr>
<tr>
<td>wild foods</td>
<td>↓</td>
</tr>
<tr>
<td><strong>Fiber</strong></td>
<td></td>
</tr>
<tr>
<td>timber</td>
<td>+/-</td>
</tr>
<tr>
<td>cotton, silk</td>
<td>+/-</td>
</tr>
<tr>
<td>wood fuel</td>
<td>↓</td>
</tr>
<tr>
<td><strong>Genetic resources</strong></td>
<td>↓</td>
</tr>
<tr>
<td><strong>Biochemicals, medicines</strong></td>
<td>↓</td>
</tr>
<tr>
<td><strong>Fresh water</strong></td>
<td>↓</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Regulating Services</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Air quality regulation</td>
<td>↓</td>
</tr>
<tr>
<td>Climate regulation – global</td>
<td>↑</td>
</tr>
<tr>
<td>Climate– regional and local</td>
<td>↓</td>
</tr>
<tr>
<td>Water regulation</td>
<td>+/-</td>
</tr>
<tr>
<td>Erosion regulation</td>
<td>↓</td>
</tr>
<tr>
<td>Water / waste treatment</td>
<td>↓</td>
</tr>
<tr>
<td>Disease regulation</td>
<td>+/-</td>
</tr>
<tr>
<td>Pest regulation</td>
<td>↓</td>
</tr>
<tr>
<td>Pollination</td>
<td>↓</td>
</tr>
<tr>
<td>Natural hazard regulation</td>
<td>↓</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cultural Services</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Spiritual / religious values</td>
<td>↓</td>
</tr>
<tr>
<td>Aesthetic values</td>
<td>↓</td>
</tr>
<tr>
<td>Recreation and ecotourism</td>
<td>+/-</td>
</tr>
</tbody>
</table>
Biodiversity underpins ecosystem functioning and the services that support human well-being.
Where does biodiversity fit in?

Human wellbeing
- Freedom and choice
- Security
- Material needs
- Health
- Social relations

Market & nonmarket values

Provisioning
- food, fibre, wood
- water, air, genes, medicines

Cultural
- aesthetics, ethics
- tourism & recreation
- spiritual, sense of place

Ecosystem services

Regulating
- climate, floods, pests & disease

Supporting
- Ecosystem processes, Habitat provision

Biodiversity
- response diversity
- interactions
- functional types
- landscape diversity
- species diversity

σ
μ
γ

insurance value
People impact nature

Nature provides people benefits
Integrated Ecosystem Assessment

A social process
Intact ecosystems provide economic benefits
Value (per hectare)

Mangrove Shrimp Farm

Coastal Protection (~$3,840)
Timber and Non-timber products ($90)
Fishery nursery ($70)

Net: $2,000 (Gross $17,900 less costs of $15,900)

Pollution Costs (-$230)

Less subsidies (-$1,700)

Restoration (-$8,240)

Private Net Present Value per hectare
Mangrove: $9,000 to $3,600
Shrimp Farm: $200 to $200

Public Net Present Value per hectare
Mangrove: $1,000 to $3,600
Shrimp Farm: $-5,400 to $200
## TOTAL ECONOMIC VALUE (TEV)

**TEV CATEGORIES**

<table>
<thead>
<tr>
<th>Direct use value</th>
<th>Indirect use value</th>
<th>Option value</th>
<th>Existence value</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Consumptive, ▪ non-consumptive</td>
<td>Watershed protection (erosion control, local flood reduction, regulation of stream flows, storm protection) Ecological processes (fixing and cycling of nutrients, soil formation, circulation and cleansing of air and water, climate regulation, carbon fixing, global life support)</td>
<td>Genetic resources Old-growth forest (irreversibilities!)</td>
<td>Bequest value (for future generations) Charismatic mega-fauna (whales, great apes, etc.) and their habitats</td>
</tr>
</tbody>
</table>

**EXAMPLES for ecosystem services**

- Hunting
- Fishing
- Timber harvesting
- Harvesting of non-timber forest products
- Harvesting of biomass
- Recreation
- Tourism

**COMMONLY USED VALUATION METHODS**

- Change in productivity, cost-based approaches, hedonic prices, travel cost, stated preference methods
- Change in productivity, cost-based approaches, stated preference methods
- Change in productivity, cost-based approaches, stated preference methods
- Stated preference methods

**TEV captures the different motives for valuing environmental assets**

**NB:** total economic value ≠ global value
• Economic valuation ≠ commercial value
• Pick the low-hanging fruit: Many valuation techniques are costly and difficult to apply, ....... But many are not
• Aim to capture the most important ecosystem services – do not try to be comprehensive
• Use simple tools where appropriate
• Consider qualitative/semi-quantitative representations; do not try to monetize everything:
  eg: # people, livelihoods dependent on the service
Exercise

Case study:

• Identify case and possible scenarios
• Identify the most important ecosystem services
• Describe status and trends, main threats
• Valuation (Qualitative or semi-quantitative):
  – Benefits – who benefits? (How do ES contribute to local livelihoods and to others, nationally & globally)
  – Costs – who pays for the protection of the ecosystem?
• Intervention (project, policy): mechanisms, institutions, management
• Monitoring & evaluation for adaptive management
**Example**

**Case study:**
Development of Cacao production in tropical forest (Cameroon)

<table>
<thead>
<tr>
<th>Ecosystem service -- and beneficiaries</th>
<th>Intact Forest</th>
<th>Intensive production</th>
<th>Agro-forestry</th>
</tr>
</thead>
<tbody>
<tr>
<td>C sequestration -- global</td>
<td>★ ★ ★</td>
<td>0</td>
<td>★ ★</td>
</tr>
<tr>
<td><strong>Forest Services and NWFP</strong></td>
<td>★ ★ ★</td>
<td>★</td>
<td>★ ★</td>
</tr>
<tr>
<td>-- local &amp; regional</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$ Cacao -- producers &amp; consumers</td>
<td>0</td>
<td>★★★</td>
<td>★ ★</td>
</tr>
<tr>
<td>$ other products -- producers &amp; consumers</td>
<td>0</td>
<td>0</td>
<td>★ ★</td>
</tr>
</tbody>
</table>
## Case study:
### Fisheries policies

<table>
<thead>
<tr>
<th>Ecosystem service -- and beneficiaries</th>
<th>Revenue</th>
<th>Livelihoods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small scale fisheries</td>
<td>$ $</td>
<td></td>
</tr>
<tr>
<td>Large scale fisheries</td>
<td>$ $ $ $ $</td>
<td></td>
</tr>
</tbody>
</table>
**Principles of the Ecosystem Approach**

1: The objectives of management of land, water and living resources are a matter of *societal choice*.

2: Management should be **decentralized** to the lowest appropriate level.

3: Ecosystem managers should **consider** the effects (actual or potential) of their activities on **adjacent and other ecosystems**.

4: Recognizing potential gains from management, there is usually a need to understand and **manage the ecosystem in an economic context**. Any such ecosystem-management programme should:
   (a) Reduce those market distortions that adversely affect biological diversity;
   (b) Align incentives to promote biodiversity conservation and sustainable use;
   (c) Internalize costs and benefits in the given ecosystem to the extent feasible.

5: **Conservation of ecosystem structure and functioning, in order to maintain ecosystem services, should be a priority target of the ecosystem approach.**

6: Ecosystems must be managed **within the limits of their functioning**.

7: The ecosystem approach should be undertaken at the **appropriate spatial and temporal scales**.

8: Recognizing the varying temporal scales and lag-effects that characterize ecosystem processes, objectives for ecosystem management should be set for the **long term**.

9: Management must **recognize** that **change** is inevitable.

10: The ecosystem approach should seek the appropriate **balance** between, and integration of, **conservation and use** of biological diversity.

11: The ecosystem approach should **consider all forms of relevant information**, including scientific and indigenous and local knowledge, innovations and practices.

12: The ecosystem approach should involve **all relevant sectors of society** and scientific disciplines.
Tasks to apply the Ecosystem Approach

How do you involve all members of society in decisions associated with the management of land, water and living resources?

How do you ensure management is decentralised to the lowest appropriate level?

How do you ensure the effects of management actions (potential or actual) on adjacent and other ecosystems are taken into account?

How can the economic context be understood so that market distortions that affect biological diversity are reduced, incentives are developed to promote biodiversity and sustainable use, and ecosystem costs and benefits are externalized?

What measures could be used to conserve ecosystem structure and functioning so as to maintain ecosystem services?

What measures can be taken to ensure ecosystems are managed within the limits of their functioning?

What actions can been taken so that the problem(s) is (are) addressed at the appropriate temporal and spatial scales?

How can varying temporal scales and lag-effects be taken into account when considering the sustainable use of ecosystems?

How can adaptive management be used to address the problem(s) identified?

How can an appropriate balance be sought between, and integration of, conservation and use of biological diversity?

How do you ensure all forms of relevant knowledge including, scientific, indigenous and local knowledge, innovations and practices are included?

What measures can be taken to facilitate the involvement of all stakeholders including all sectors of society and scientific disciplines?
The essentials

- Objectives a matter of societal choice
- Manage the ecosystem in an economic context, consider distribution of costs and benefits
- Consider all forms of relevant information
- Conserve ecosystem processes and functions, to maintain ecosystem services
- Use adaptive management practices
- Carry out management actions at the appropriate scale, decentralized to lowest appropriate level
- Ensure inter-sectoral cooperation
Ecosystem Approach Toolkit

- [http://www.cbd.int/ecosystem/](http://www.cbd.int/ecosystem/)
- Ecosystem Approach Principles and Guidance
- Other CBD decisions
- User Guides
- Applications of Ecosystem approach to sectors
- Tools:
  - Stakeholder consultation
  - Conflict management
  - Environmental assessment (SEA and EIA)
  - Valuation
  - Integrated resource management
  - Integrated land use planning
  - Modeling
  - Monitoring