The Economics of Ecosystems and Biodiversity (TEEB): Water and Wetlands
Presentation of the Final Report

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Presentation overview

1. TEEB & The TEEB for Water and Wetlands Project
2. Water and wetlands: what benefits do we derive and what do we risk losing?
3. Measuring to manage better
4. Integrating the values of water and wetlands into decision making
5. Recommendations: Transforming our approach to water and wetlands
TEEB’s Genesis, Aims and progress

**G8+5 Potsdam**

"Potsdam Initiative – Biological Diversity 2010"

1) The economic significance of the global loss of biological diversity

Importance of recognising, demonstrating & responding to values of nature

Engagement: ~500 authors, reviewers & cases from across the globe

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**Interim Report**

**Climate Issues Update**

**TEEB End User Reports Brussels 2009, London 2010**

**TEEB Synthesis**

**TEEB Books**

**TEEB W&W Nature & GE TEEB Oceans**

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**CBD COP 9 Bonn 2008**

**Input to UNFCCC 2009**

India, Brazil, Belgium, Japan & South Africa Sept. 2010

**BD COP 10 Nagoya, Oct 2010**

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**Ecol./ Env. Economics literature**

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The “nexus” between water, food and energy is one of the most fundamental relationships - and increasing challenges - for society. Biodiversity and particularly wetland ecosystems are increasingly understood to be at the core of this nexus.

Water security is a major and increasing concern in many parts of the world, including both the availability (including extreme events) and quality of water.
Global and local water cycles are strongly dependent on wetlands.

Without wetlands, the water cycle, carbon cycle, and nutrient cycles would be significantly altered, mostly detrimentally.

Yet policies and do not take into account these interconnections and inter-dependencies.
Wetlands & ecosystem services

• Wetlands are solution to water security.

• They provide multiple ecosystem services supporting water security as well as offering many other benefits and values to society and the economy.

• Meeting sustainable water management objectives cost effectively via wetland ecosystem services.
- **Climate Regulation**
  - Extent of carbon storage vulnerable to water insecurity

- **Water scarcity**
  - Conflicts

- **Hydropower**

- **Water availability**
  - Soil moisture

- **Nutrient cycling/clean water**
  - Sanitation; Drinking water Water quality

- **Water availability**
  - - mitigating extremes

- **Clean water**
  - Cities using PAs to provide water

- **Water availability**
  - Use by economic activity
  - Household consumption

- **Nutrient cycling/clean water**
  - Waste water treatment

- **Water availability**
  - Land affected by desertification
  - Crop water productivity
  - Area water-logged/salinised

- **Sediment transfer**
• Despite their values and potential policy synergies, wetlands have been and continue to be lost of degraded. This leads to biodiversity loss and a loss of ecosystem services.

• Wetlands loss can lead to significant losses in human well-being and have negative economic impacts on communities, countries and business.

“I believe that the great part of miseries of mankind are brought upon them by false estimates they have made of the value of things.”

Benjamin Franklin, 1706-1790
Wetlands: historical loss of natural capital

- Since 1990 the world has lost around 50% of its wetlands (UNWWAP 2003) and around 60% loss in Europe (EEA 2010)

- In the past two decades, 35% of mangroves have disappeared. Some countries have lost up to 80% (MA 2005)

- ~20% of the world’s coral reefs - destroyed
- 24% of the remaining reefs under imminent risk of collapse through human pressures.

See TEEB 2011 for refs)
The evidence base: range of values of ecosystem services

Values of both coastal and inland wetland ecosystem services are typically higher than for other ecosystem types.
Evidence base - Assessing values and actions

Assessing the value of working with natural capital has helped determine where ecosystems can provide goods and services at lower cost than by man-made technological alternatives and where they can lead to significant savings.

- **USA-NY**: Catskills-Delaware watershed for NY: PES/working with nature saves money (~5 US$bn)
- **New Zealand**: Te Papanui Park - water supply to hydropower, Dunedin city, farmers (~$136m)
- **Mexico**: PSAH to forest owners, aquifer recharge, water quality, deforestation, poverty (~US$303m)
- **France**: Priv. Sector: Vittel (Mineral water) PES et al for water quality
- **Venezuela**: PA helps avoid potential replacement costs of hydro dams (~US$90-$134m over 30yr)
- **Vietnam**: restoring/investing in Mangroves - cheaper than dyke maintenance (~US$: 1m to 7m/yr)
- **South Africa**: WfW public PES to address IAS, avoids costs and provides jobs (~20,000; 52%♀)

Sources: various. Mainly in TEEB for National and International Policy Makers, TEEB for local and regional policy and TEEB cases.
Wetlands provide natural infrastructure that can help meet a range of policy objectives.

Beyond water availability and quality, they are invaluable in supporting climate change mitigation and adaptation, support health as well as livelihoods, local development and poverty eradication.
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## Benefits provided by mangroves & shrimp farms: an economic illustration  
(in US$/ha NPV 9 years 10% discount rate)

<table>
<thead>
<tr>
<th>Commercial profits from shrimp farming</th>
<th>Commercial profits from mangrove forest</th>
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<tbody>
<tr>
<td>9632</td>
<td></td>
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<tr>
<td>584</td>
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</table>

All values are NPV over 9 years and a 10% discount rate, given in 1996 US$.

Source: drawn from data from Barbier et al., 2007 and Hanley and Barbier, 2009
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- **Policy synergies:** Working with nature can be a cost effective way of meeting a range of policy, business and private objectives.

- **Integrated water resource management (IWRM), Integrated coastal zone management (ICZM) and Maritime Spatial Planning (MSP)** if properly applied can help meet multiple objectives

- **Range of instruments can help manage & protect wetland ecosystem services**
  - Site management and investment
  - Regulation and land-use planning (PAs, zoning)
  - Property rights (ownership, use, access etc)
  - Market creation – information, pricing, incentives
  - Subsidy reform, funds, trading schemes & payment for ecosystem services
  - Voluntary schemes (offsets et al).
'We never know the worth of water 'til the well is dry'.  English proverb

‘Men do not value a good deed unless it brings a reward’  Ovid, B.C. 43 – 18 A.D., Roman Poet
Solution: Mexico PSAH: PES to forest owners to preserve forest: manage & not convert forest

Result
Deforestation rate fell from 1.6 % to 0.6 %. 18.3 thousand hectares of avoided deforestation Avoided GHG emissions ~ 3.2 million tCO2e

Hydrological services: Aquifer recharge; Improved surface water quality, reduce frequency & damage from flooding

Investment in good spatially relevant data critical to develop an evidence base for policy instruments
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Wetlands and water-related ecosystem services need to become an integral part of water management in order to make the transition to a resource efficient sustainable economy.

• Investing in restoration
• Incorporating traditional knowledge
• Sustainable tourism
• Aiming for synergies between restoration and poverty alleviation
• Engage in transition management.

Action at all levels and by all stakeholders is needed if the opportunities and benefits of working with water and wetlands are to be fully realised and the consequences of continuing wetland loss appreciated and acted upon.
Restoration: can be costly, but can offer good returns

For example: **Germany**: peatland restoration: avoidance cost of CO2 ~ 8 to 12 €/t CO₂ (0-4 alt. land use). Lower than many other carbon capture and storage options
Working for Water (WfW): SA & The Manalana wetland

- Severely degraded by erosion that threatened to consume the entire system
- WfW public works programme intervened in 2006 to reduce the erosion and improve the wetland’s ability to continue providing its beneficial services

Results
- Livelihood benefits from degraded wetland was just 34% of healthy ecosystem
- Rehabilitated wetland contributes provisioning services at 297 EUR/household/year
- Livelihood benefits ~ 182,000 EUR by the rehabilitated wetland; x2 costs
- The Manalana wetland acts as a safety net for households.

Sources: Pollard et al. 2008; Wunder et al 2008a; http://www.dwaf.gov.za/wfw
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<th>Global:</th>
<th><strong>Strategic Plan Biodiversity 2011-2020 &amp; integration in MEAs</strong></th>
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<tr>
<td>National:</td>
<td><strong>Integration of values into decision making, strategies and make use of NBSAPs</strong></td>
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<td>Local:</td>
<td><strong>Assess interlinks: wetlands, communities, man-made infrastructures and the economy</strong></td>
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<td>Site managers:</td>
<td><strong>Develop site management plans to ensure wise use of wetlands, including sustained provision of ecosystem services</strong></td>
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<td>Academia:</td>
<td><strong>Contribute to fill the knowledge gaps</strong></td>
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<td>Development cooperation community:</td>
<td><strong>Integrate appreciation of multiple benefits and potential cost savings into dev co-op objectives and implementation on the ground</strong></td>
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<td>NGOs:</td>
<td><strong>Support wetland mang’t via funding &amp; expertise, inc. volunteers</strong></td>
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<td>Business:</td>
<td><strong>Identify impacts and dependencies, risks and opportunities, and EP&amp;Ls</strong></td>
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Thank you

TEEB Reports available on http://www.teebweb.org/

See also www.teeb4me.com

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