



The Economics of Ecosystems and Biodiversity (TEEB): Water and Wetlands

Presentation of the Final Report

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Friday 1 February 2013 – 10 am
International Environment House, Geneva



Federal Ministry for the
Environment, Nature Conservation
and Nuclear Safety



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra



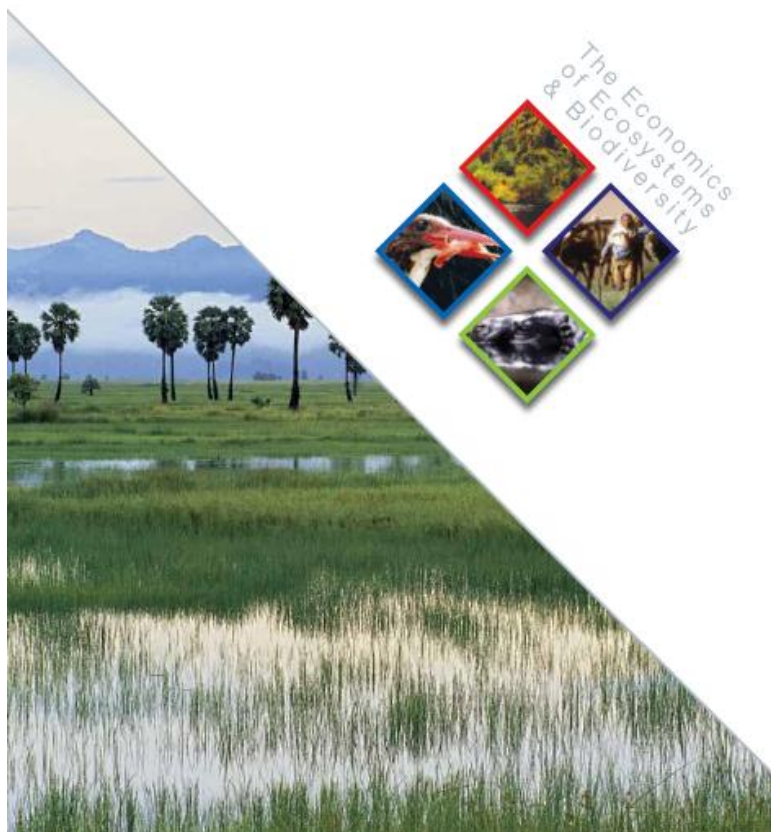
Rijksoverheid





Presentation overview

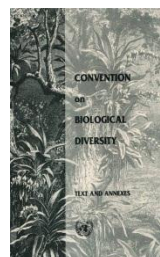
THE ECONOMICS OF ECOSYSTEMS AND BIODIVERSITY
FOR WATER AND WETLANDS



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"

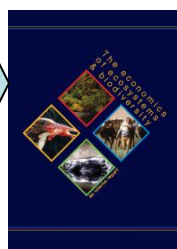
1) The economic significance of the global loss of biological diversity

Importance of recognising, demonstrating & responding to values of nature

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



**Interim
Report**



**CBD COP 9
Bonn 2008**

**Climate
Issues Update**



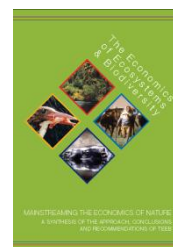
**Input to
UNFCCC 2009**

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



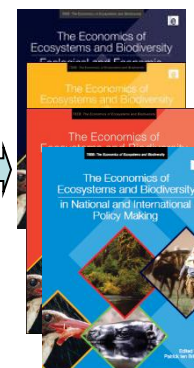
**India, Brazil, Belgium,
Japan & South Africa
Sept. 2010**

**TEEB
Synthesis**



**BD COP 10
Nagoya, Oct 2010**

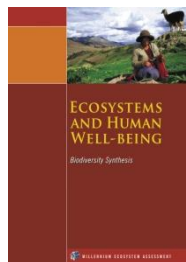
**TEEB
Books**



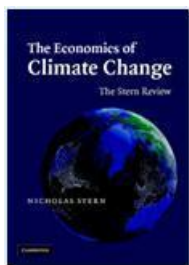
**TEEB W&W
Nature & GE
TEEB Oceans**



**TEEB studies
The Netherlands,
Germany, Nordics,
Norway, India, Brazil**



**Ecol./Env.
Economics
literature**



TEEB Water and Wetlands

THE ECONOMICS OF ECOSYSTEMS AND BIODIVERSITY
FOR WATER AND WETLANDS



Core Team



Case contributions

Reviewers

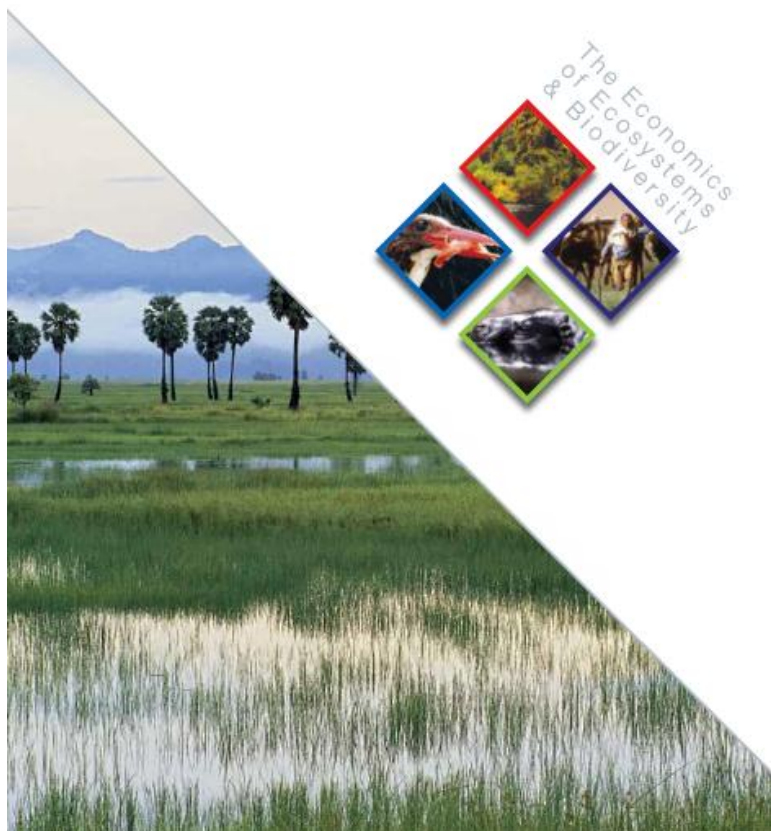
Discussions at Rio+20, Ramsar
COP 11, CBD COP11

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Executive Summary: ten Brink P., Russi D., Farmer A., Badura T., Coates D., Förster J., Kumar R. and Davidson N. (2013) *The Economics of Ecosystems and Biodiversity for Water and Wetlands*. Executive Summary.



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For further details see Chapter 2 (page 5 to 17) and Chapter 3 (pages 19 to 33) of the TEEB Water and Wetlands report

The “nexus” between water, food and energy is one of the most fundamental relationships - and increasing challenges - for society.

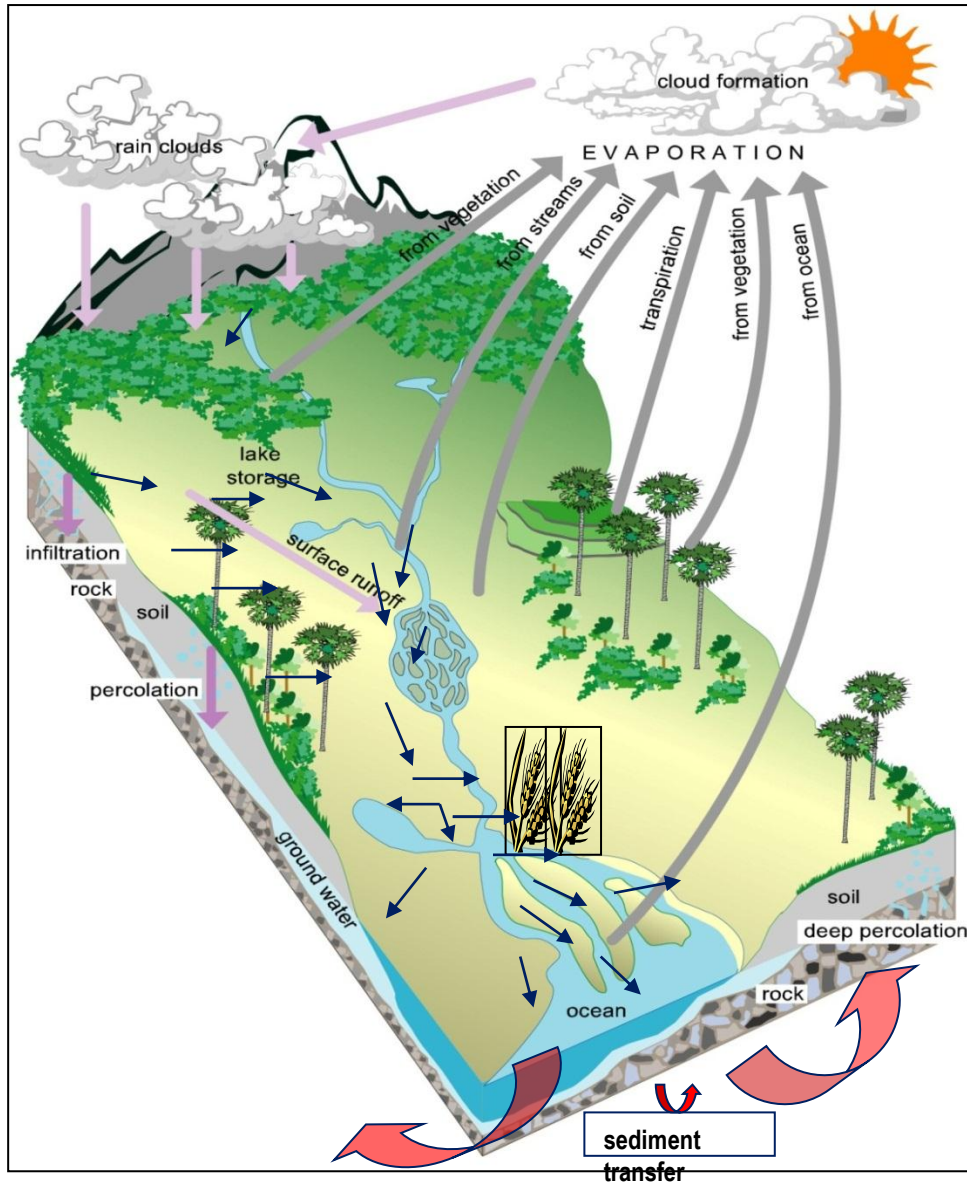
Biodiversity and particularly wetland ecosystems are increasingly understood to be at the core of this nexus.



Photo credit: Nick Davidson

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.

Wetlands & Water Cycle



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

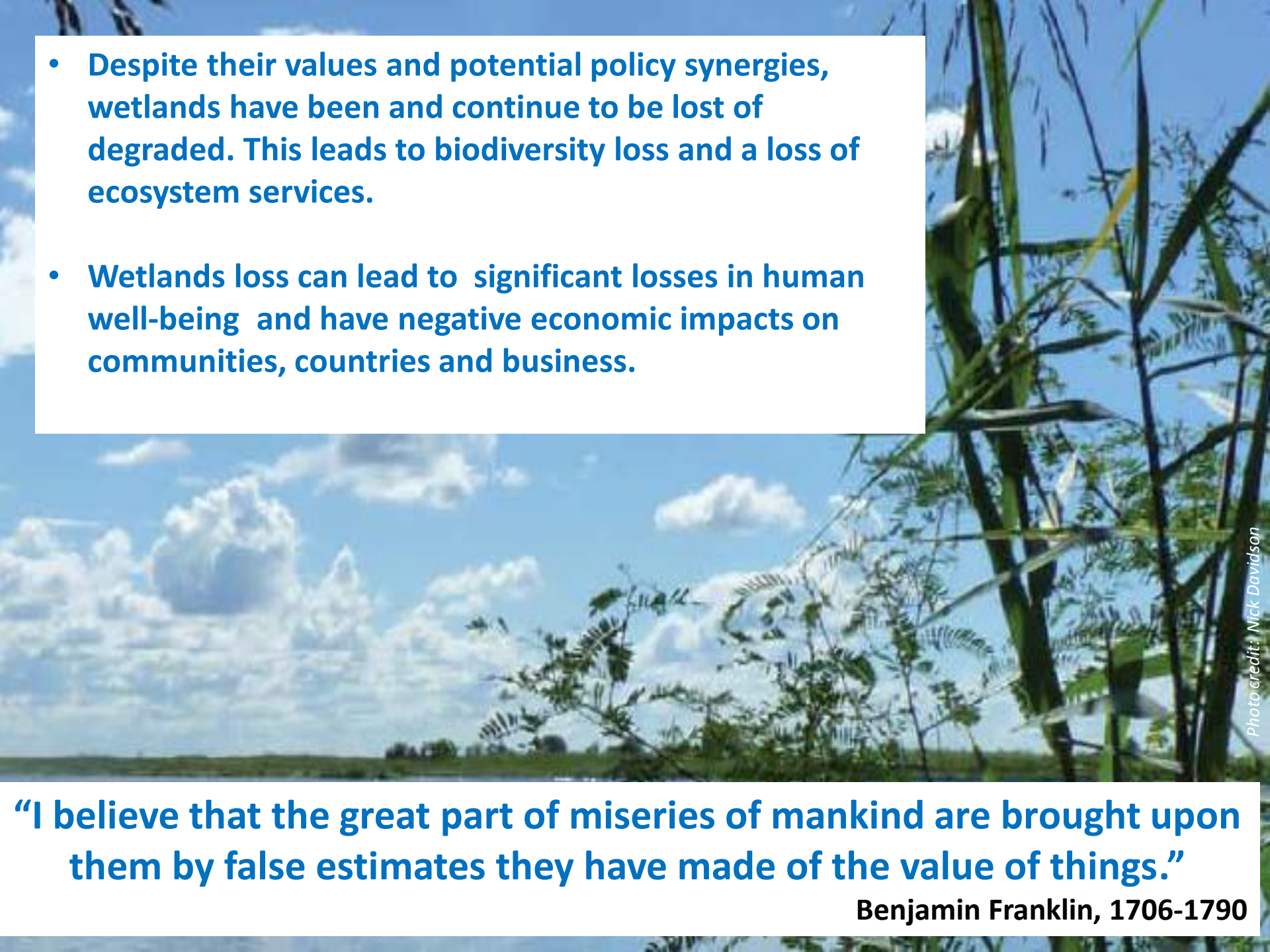
- 
- Despite their values and potential policy synergies, wetlands have been and continue to be lost or degraded. This leads to biodiversity loss and a loss of ecosystem services.
 - Wetlands loss can lead to significant losses in human well-being and have negative economic impacts on communities, countries and business.

Photo credit: Nick Davidson

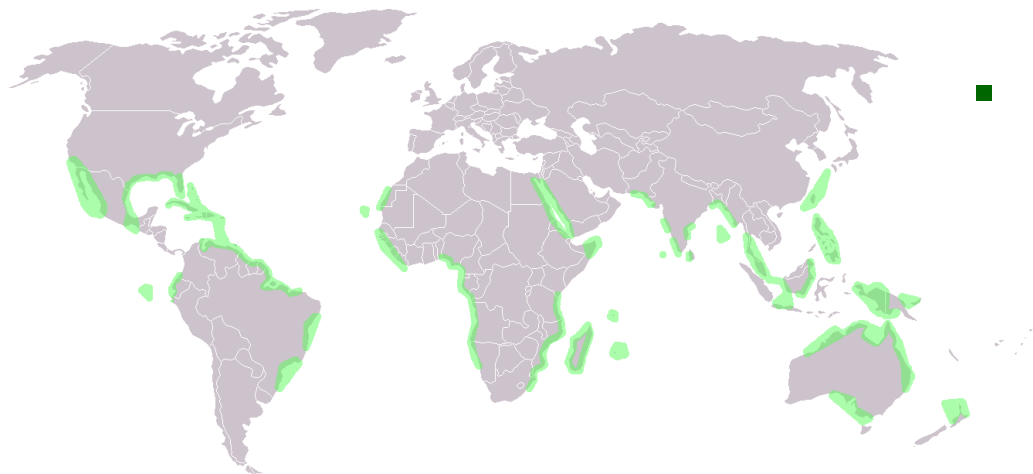
“I believe that the great part of miseries of mankind are brought upon them by false estimates they have made of the value of things.”

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)

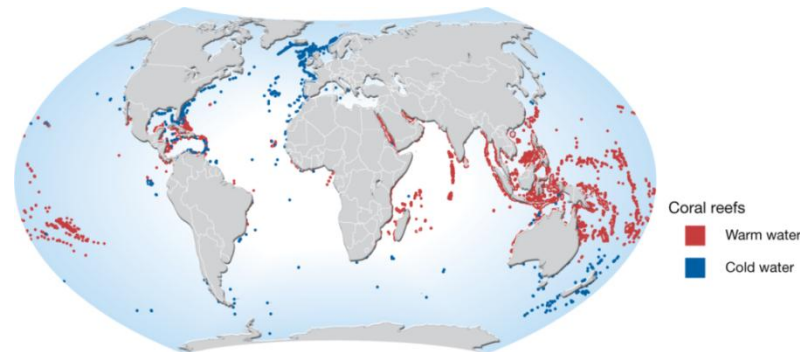


http://upload.wikimedia.org/wikipedia/commons/9/95/World_map_mangrove_distribution.png

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

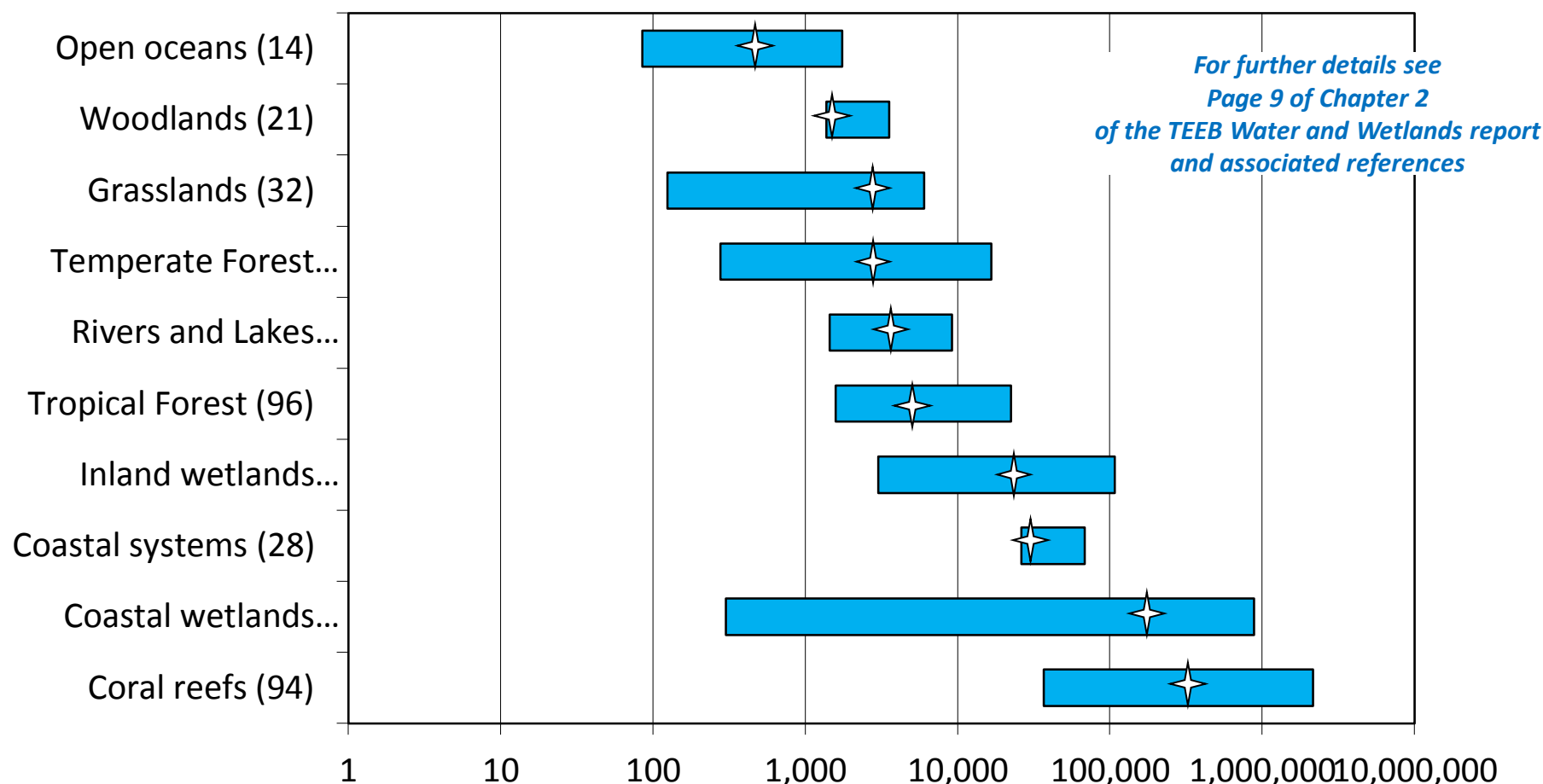
- ~20%** of the world's coral reefs - destroyed
- 24%** of the remaining reefs under imminent risk of collapse through human pressures.

(Wilkinson C., 2004; Nellemann et al 2008)





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

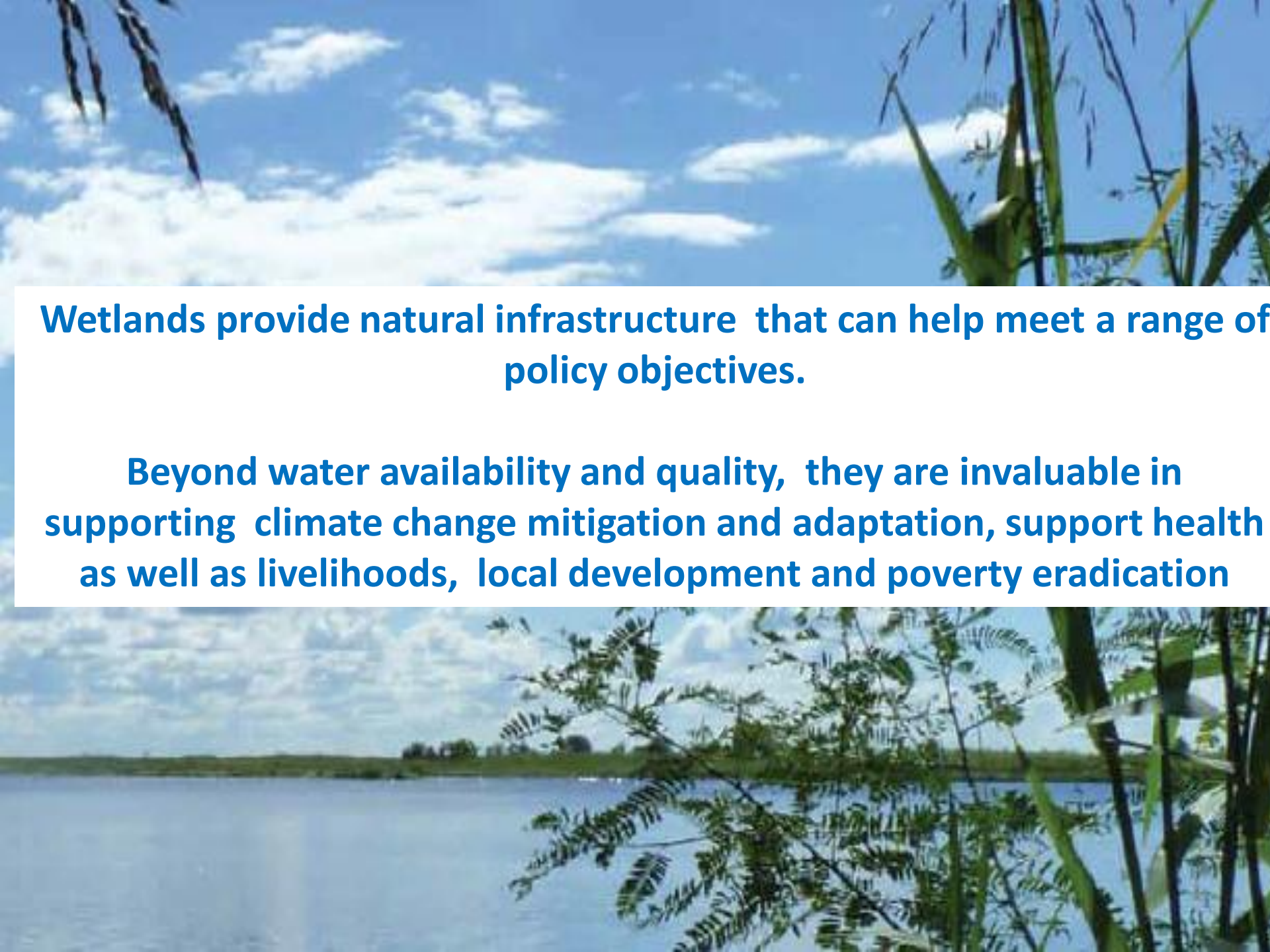


Evidence base - Assessing values and actions

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 (~5US\$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%♀)

Critical to assess where working with nature saves money for public (city, region, national), private sector, communities and citizens & who can make it happen

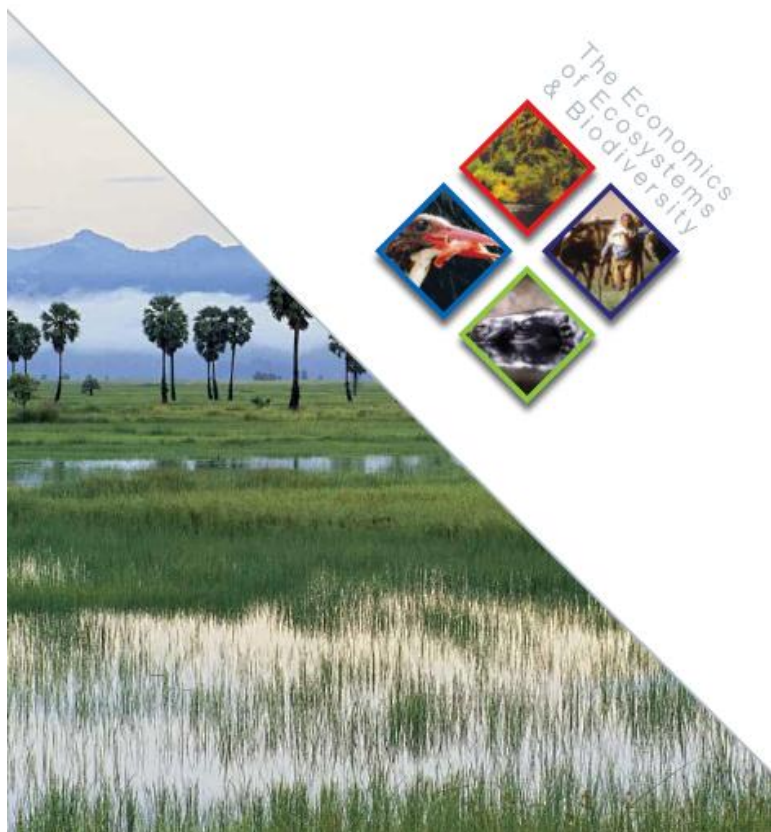


Wetlands provide natural infrastructure that can help meet a range of policy objectives.

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



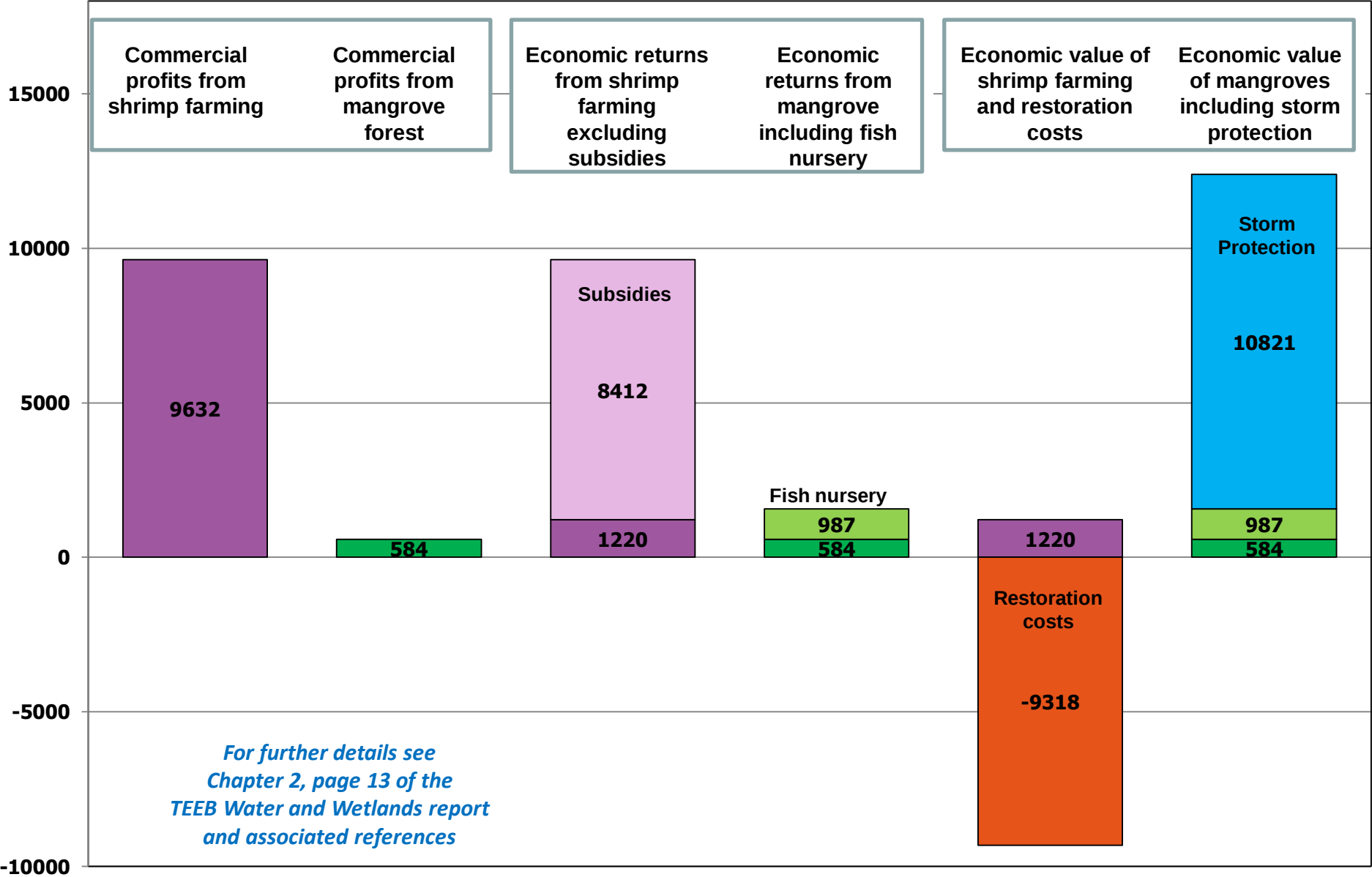
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Benefits provided by mangroves & shrimp farms: an economic illustration (in US\$/ha NPV 9 years 10% discount rate)

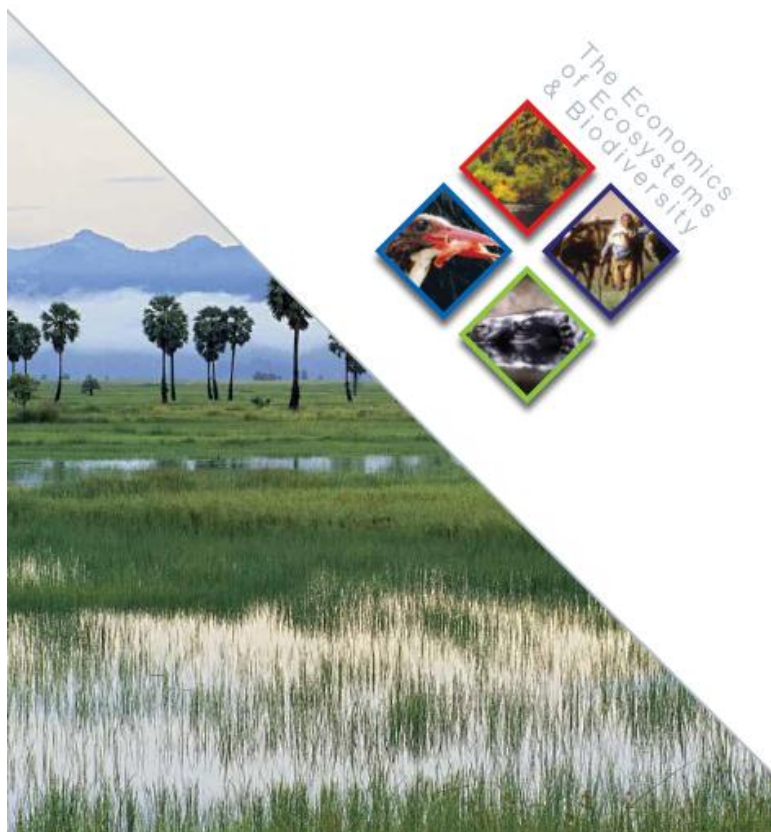


Source: drawn from data from Barbier et al., 2007 and Hanley and Barbier, 2009

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



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*For further details see Chapter 4 (page 35 to 45) of the
TEEB Water and Wetlands report*



4. Integrating the values of water and wetlands into decision making

- **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

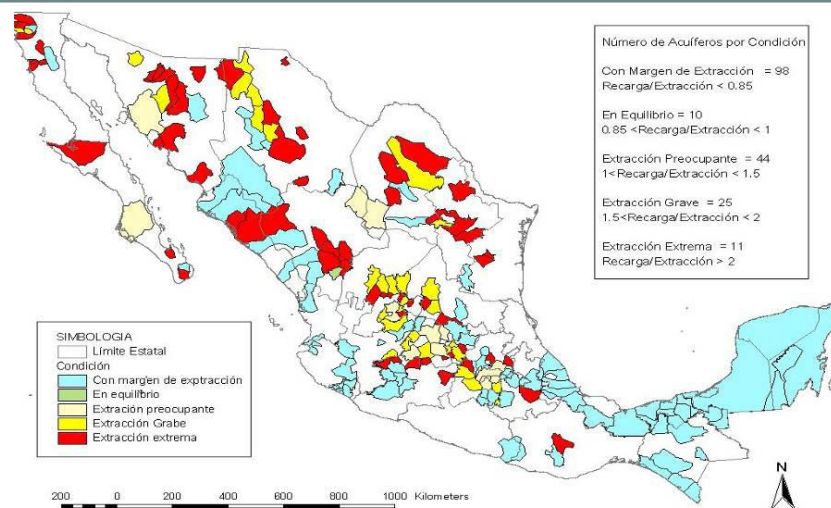
Results:

Deforestation rate fell from 1.6 % to 0.6 %.

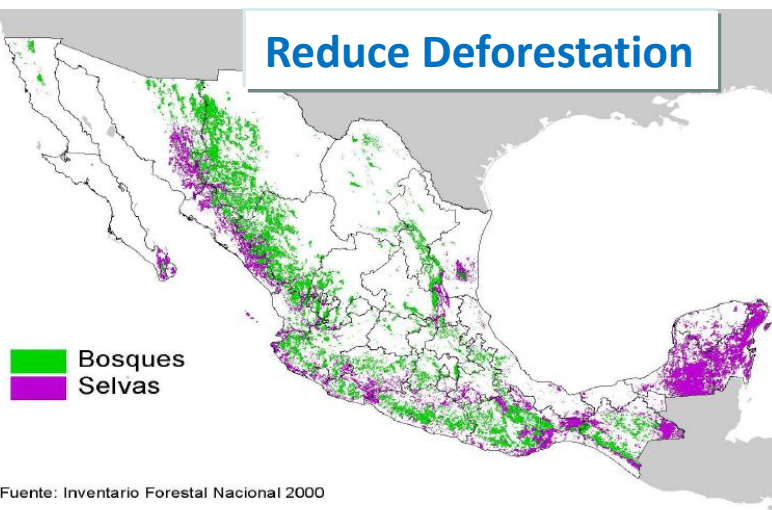
18.3 thousand hectares of avoided deforestation

Avoided GHG emissions ~ 3.2 million tCO₂e

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



Reduce Deforestation



Fuente: Inventario Forestal Nacional 2000

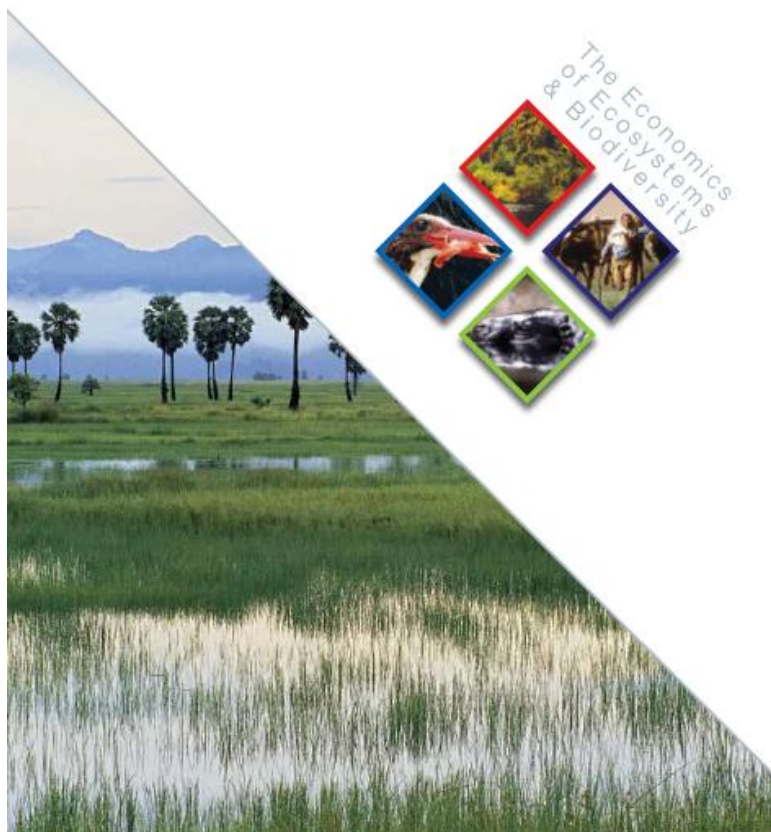
Address Poverty



Fuente: CONAPO



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*For further details see Chapter 5 (page 47 to 58) of the
TEEB Water and Wetlands report*



5. Transforming our approach to water and wetlands

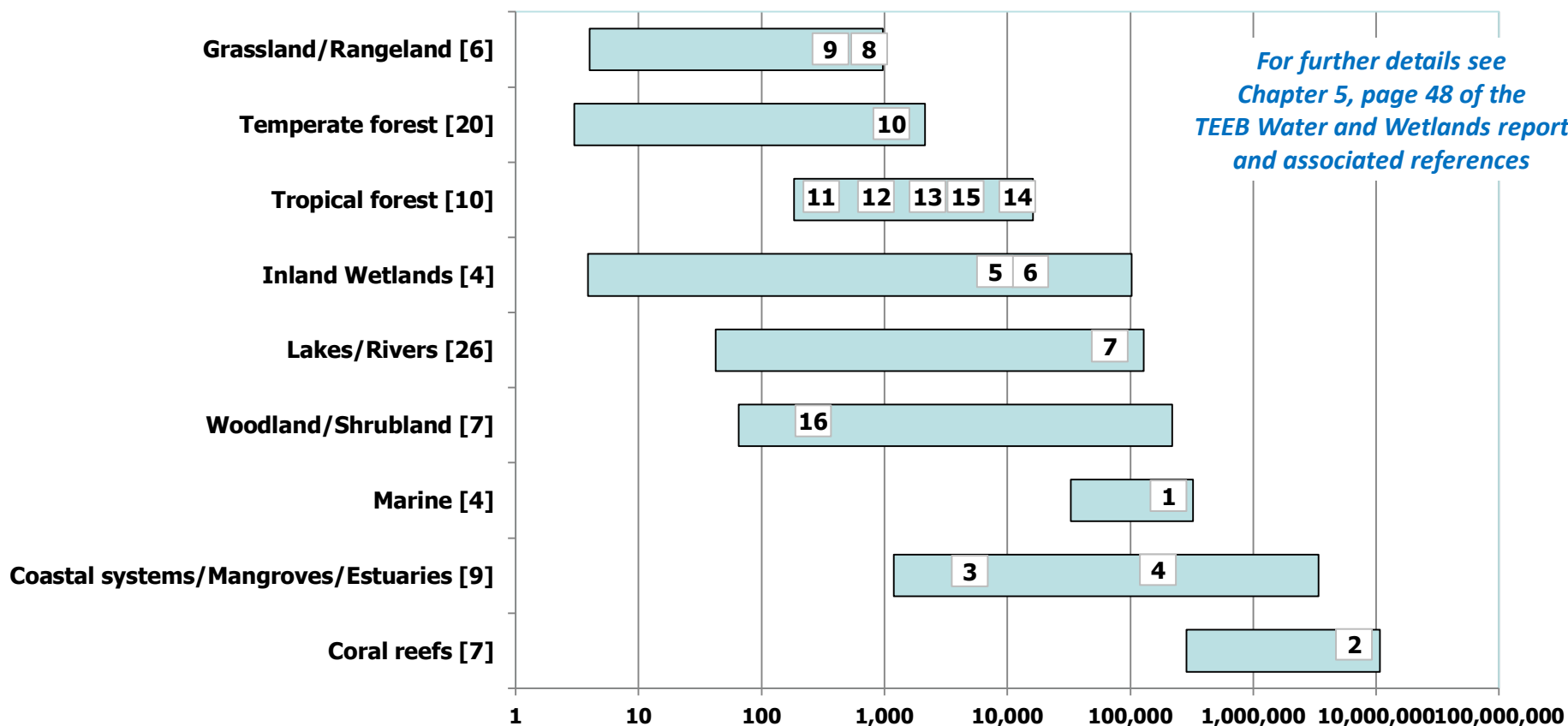
Wetlands and water-related ecosystem services need to become an integral part of water management in order to make the transition to a resource efficient sustainable economy.

- 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



Sources: Aronson et al. 2010

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**.

Global: Strategic Plan Biodiversity 2011-2020 & integration in MEAs

National: Integration of values into decision making, strategies and make use of NBSAPs

Local: Assess interlinks : wetlands, communities, man-made infrastructures and the economy

Site managers: Develop site management plans to ensure wise use of wetlands, including sustained provision of ecosystem services

Academia: Contribute to fill the knowledge gaps

Development cooperation community: integrate appreciation of multiple benefits and potential cost savings into dev co-op objectives and implementation on the ground

NGOs: support wetland mang't via funding & expertise, inc. volunteers

Business: Identify impacts and dependencies, risks and opportunities , and EP&Ls



Thank you

TEEB Reports available on

www.teebweb.org, www.ramsar.org and www.ieep.eu

See also www.teeb4me.com

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Rijksverheid

