



Tokyo TEEB Symposium

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## The Economics of Ecosystems and Biodiversity (TEEB)

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### What is “Biodiversity” ?

*Biodiversity is  
the living fabric  
of this planet*

...the extent & variety of its **Ecosystems**  
...the abundance & diversity of its **Species**  
...the variability and number of its **Genes**



### Big Differences between Climate Change and Biodiversity

- Climate Change is a **Global Public Bad**
- Biodiversity is a combination of **three tiers of Public Good : Local, National, Global**
- Climate Change can be measured in terms of “**CO<sub>2</sub>e**”
- Biodiversity needs **many different indicators** – at least 20 simultaneous indicators are being considered

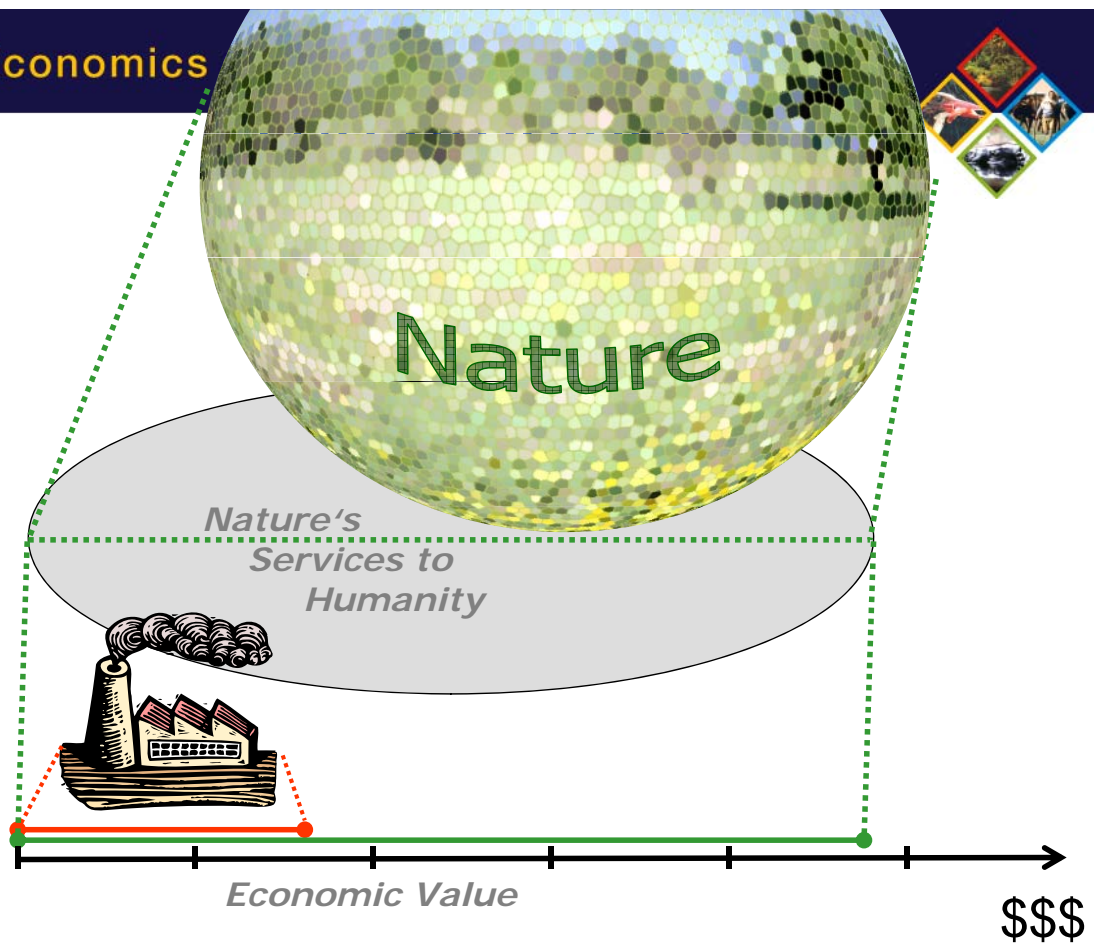


### What is TEEB about ?



- ❖ Demonstrating that biodiversity loss is a loss in human welfare, an economic loss, globally, locally
- ❖ For Governments : economical, equitable, practical policy solutions to biodiversity loss at every policy level - local, national, international
- ❖ For Businesses : a new world of risks, opportunities, disclosures
- ❖ For Citizens : “Biodiversity is *Our Life*”

## The Economics

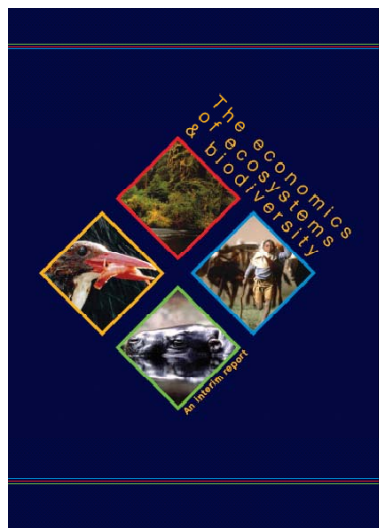


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Photo: C.Neßhöver, UFZ

## The Economics of Ecosystems & Biodiversity

### TEEB – “Phase 1” Three Key Messages



Economic Size & Welfare Impact of Losses is **huge**



Strong link with **Poverty** & risk of **MDG's** failure



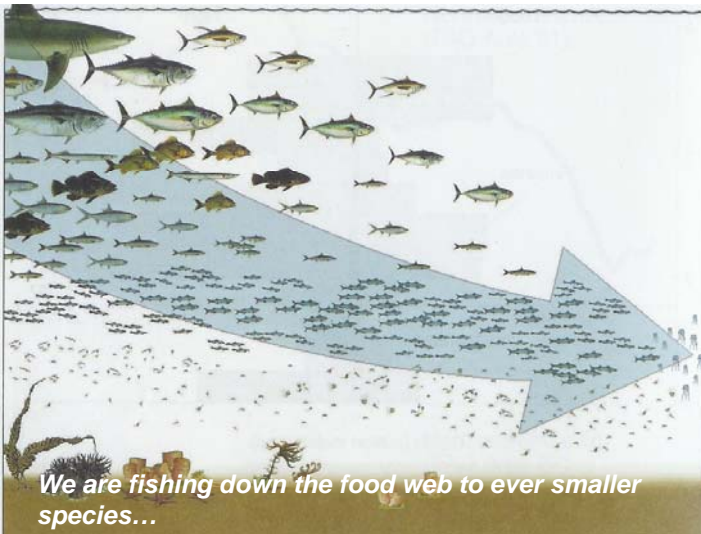
Discount rates are **ethical** choices

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## Global Fisheries... A Problem with Many Dimensions



❑ Open Access system & Perverse Subsidies are key drivers of the loss of fisheries

❑ Half of wild marine fisheries are fully exploited, with a further quarter already over-exploited

❑ *lost productivity : est. \$ 50 billion*

❑ *at risk : \$ 85 -100 billion landed catch from the sector*

❑ *at risk : est. 27 million jobs*

❑ *but most important of all....*

**at risk : Health ... over a billion rely on fish as their main or sole source of animal protein, especially in developing countries**

Source: Ben ten Brink (MNP) presentation at the Workshop: *The Economics of the Global Loss of Biological Diversity 5-6 March 2008, Brussels, Belgium. Original source: Pauly*



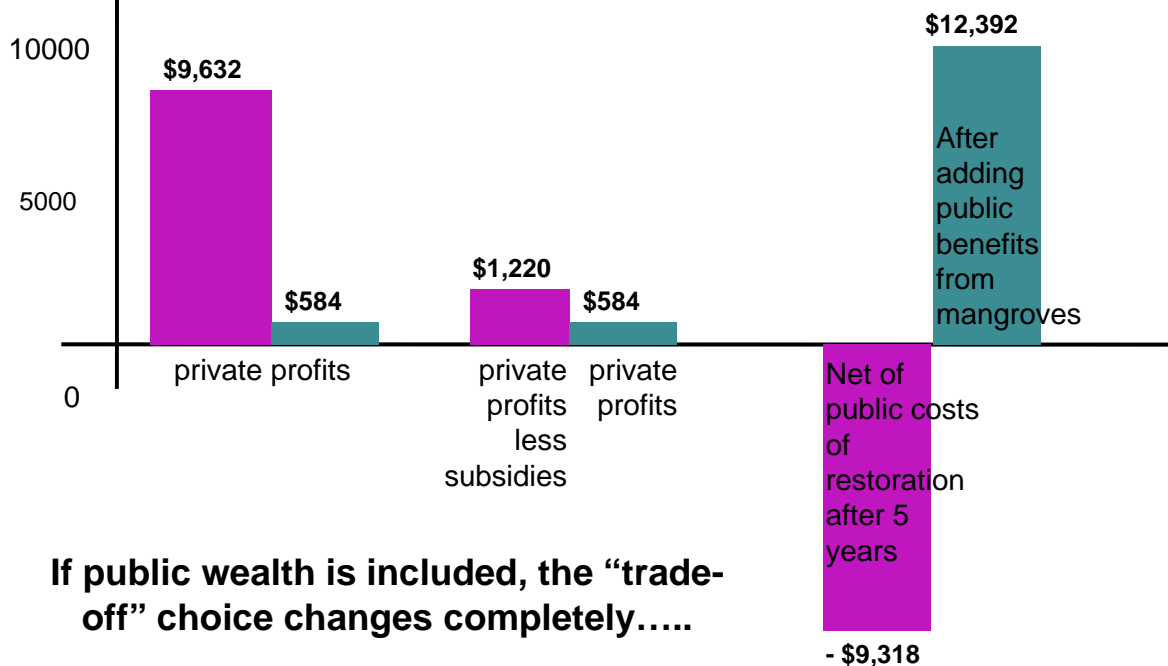
NPV  
(over 9 yrs)

## Private Profits, Public Losses...

US\$/ha  
in 1996

**Most "trade-offs" only measure private profits.....**

■ Shrimp Farm  
■ Mangroves



**If public wealth is included, the "trade-off" choice changes completely.....**

Source: Hanley and Barbier 2009

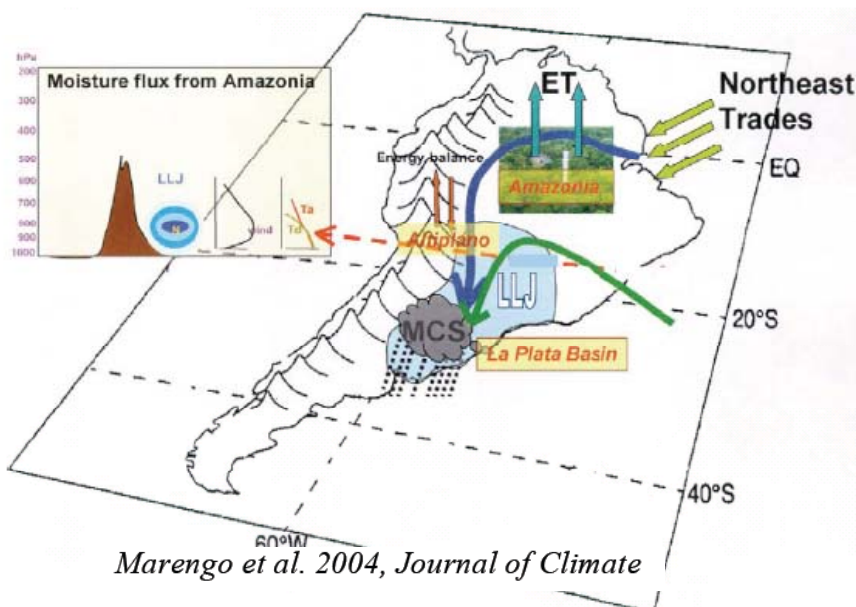


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## The Economics of Ecosystems & Biodiversity



Question : What does the Granary of Latin America pay for its Freshwater ??



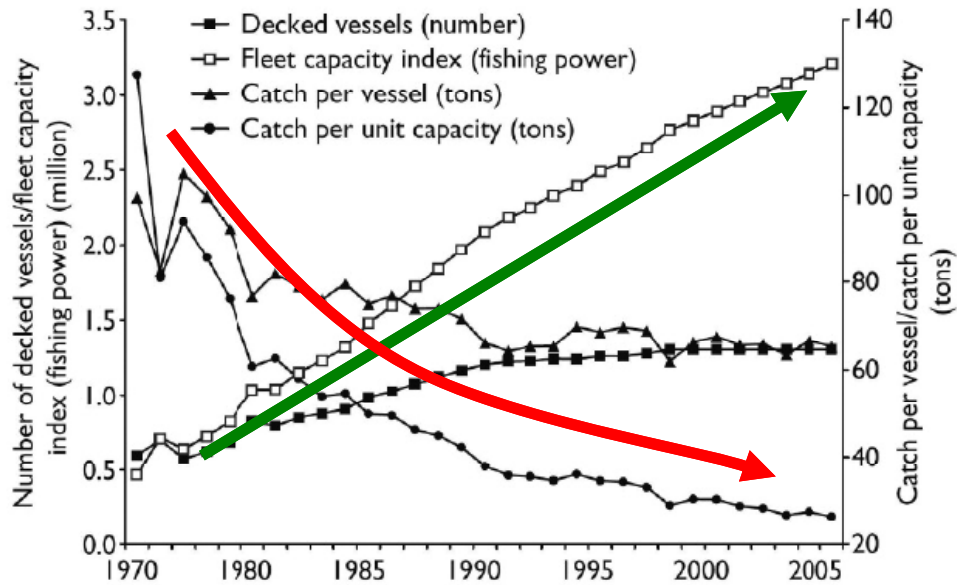
### Amazon Rainforest “Water Pump”

Evapo-transpiration puts 20 billion tonnes of water into the atmosphere daily, some of which falls as rain in the Rio Plata Basin...

(Global Canopy Programme & Canopy Capital Ltd, 2008)



## Fish stocks : underperforming assets

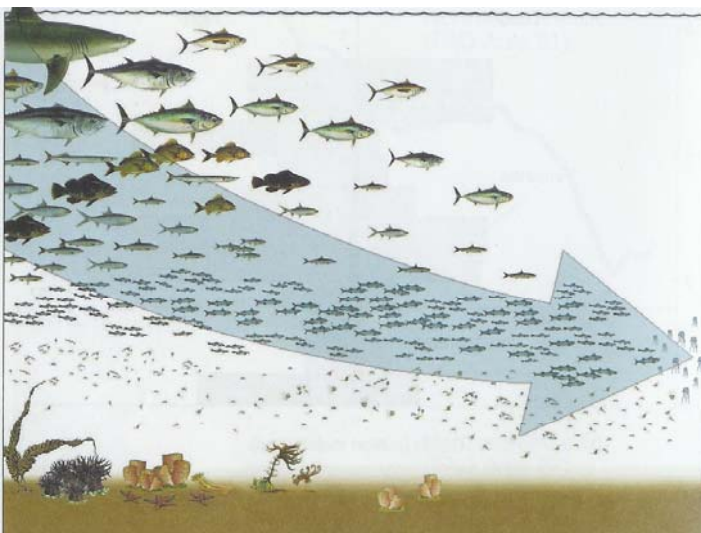


World Bank estimates that net benefit losses from fisheries are 50 billion US\$ per year

TEEB D1, Chap.10; World Bank & FAO 2008



## Global Fisheries... Is there a Solution ?



*We are fishing down the food web to ever smaller species...*

**Is there evidence that reserves work ?**

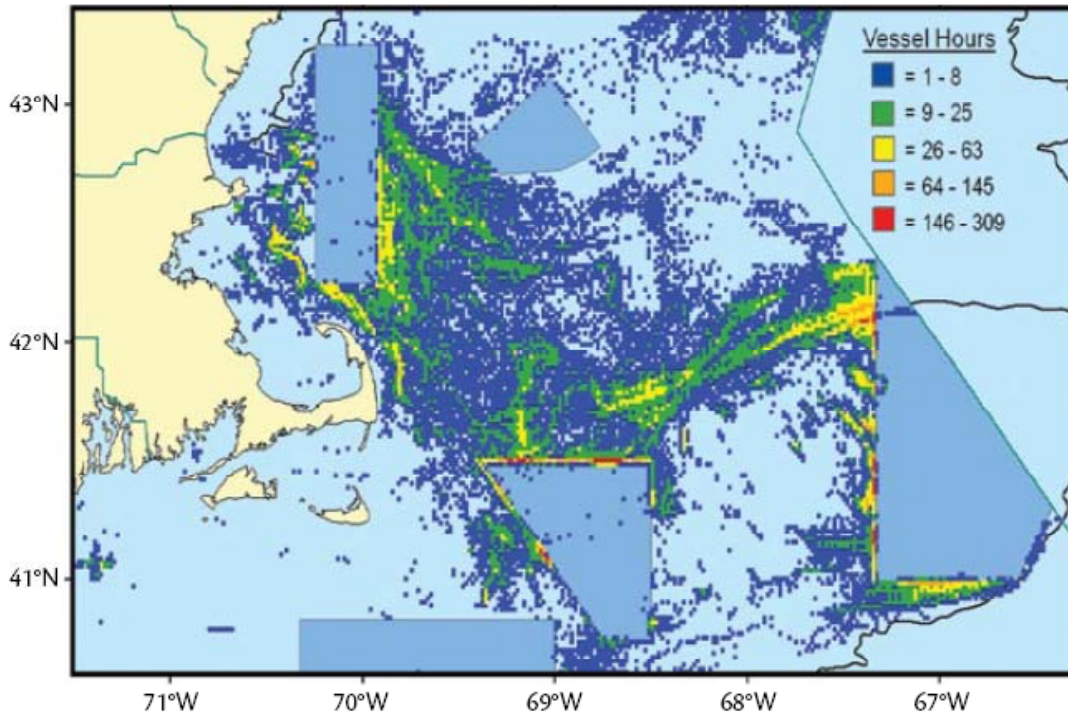


*Reserves all over the world show dramatic increases in spawning stocks*

# The Economics of Ecosystems & Biodiversity

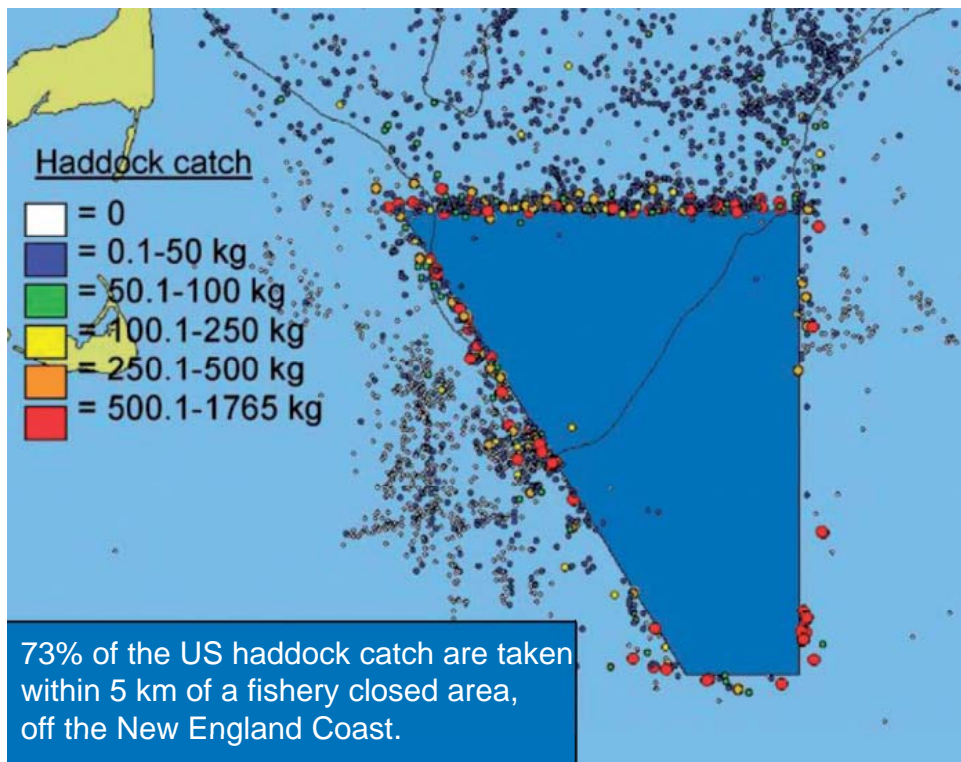


Eg : Distribution of fishing effort around Georges Bank closed areas



Source: Fogarty et al. (2007)

# The Economics of Ecosystems & Biodiversity





### Singapore : City Biodiversity Index

Objective : help cities benchmark the success of their efforts to reduce biodiversity loss and hopefully enhance urban biodiversity in the longer term.

- A grading system to measure how cities worldwide are conserving their plant and animal species.
- The **Singapore Index on Cities' Biodiversity** would measure performance and assign scores based on three categories:-

- 1 Biodiversity** : the count of plant, animal and other species ;
- 2 Ecosystem Services** : The services that this biodiversity provides, such as pollination, as carbon sinks; and
- 3 Management** : How well a city manages its biodiversity ( Eg : by setting up a conservation agency, or a museum, to document species and habitats.)



### Valuation for Support in planning and management in Vietnam

- Coastal communities vulnerable to storm damage;
- 80% of the population is believed to live at risk of flooding
- Evaluation studies suggest that restoration of natural mangrove forests is more cost effective than building artificial barriers.
- Since 1994, local communities planted and protected mangroves in northern coastal regions. Over 125,000 ha of mangroves have been planted, resulting in reduced coastal erosion
- **An investment of US\$1.1 million saved an estimated US\$7.3 million a year in sea dyke maintenance;**
- During typhoon Wukong in 2000 the project areas remained relatively unharmed compared with neighbouring provinces
- Building on this initial analysis and success, mangroves have now also been restored in the southern part of the country around Mui Ca Mau National Park, at the end of the Mekong Delta.



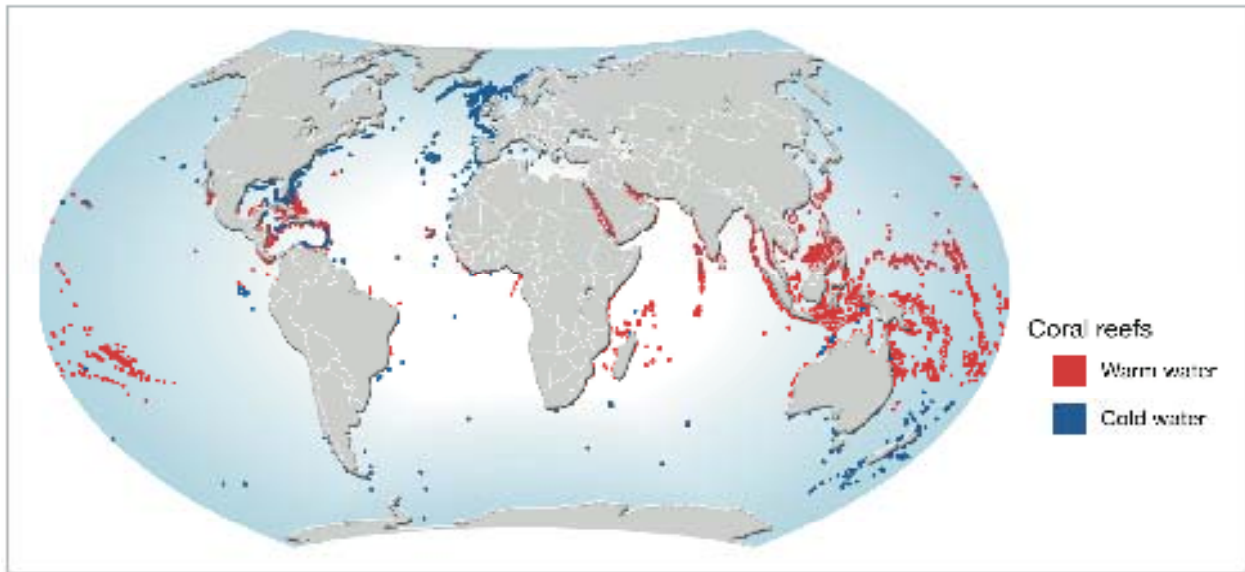
## Kampala, Uganda

- Plans to drain the Nakivubo Swamp (>40sqkm) for improved agri production
- Waste water treatment capacity of the swamp was assessed (Emerton , 2004)
- Maintaining the wetlands: ~ 235.000\$ p.a.
- Running a sewage treatment facility with equivalent capacity ~2.000.000\$ p.a.
- Thus, draining plans were abandoned and Nakivubo Swamps gazetted as protected area



# The Economics of Ecosystems & Biodiversity

## Tropical Coral Reefs...



- ❖ 25% of Fish Species in the seas
- ❖ Food and livelihoods for 500 Million poor people



**WHAT WE THINK CORAL REEFS LOOK LIKE....**



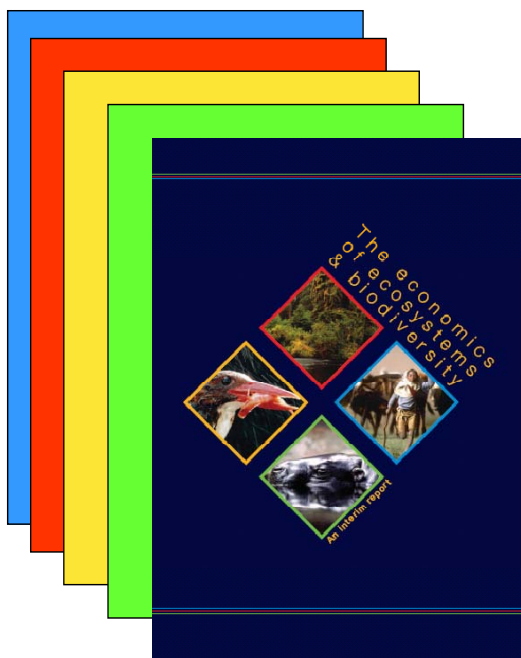
# The Economics of Ecosystems & Biodiversity



**WHAT THEY ACTUALLY LOOK LIKE....**



# The Economics of Ecosystems & Biodiversity

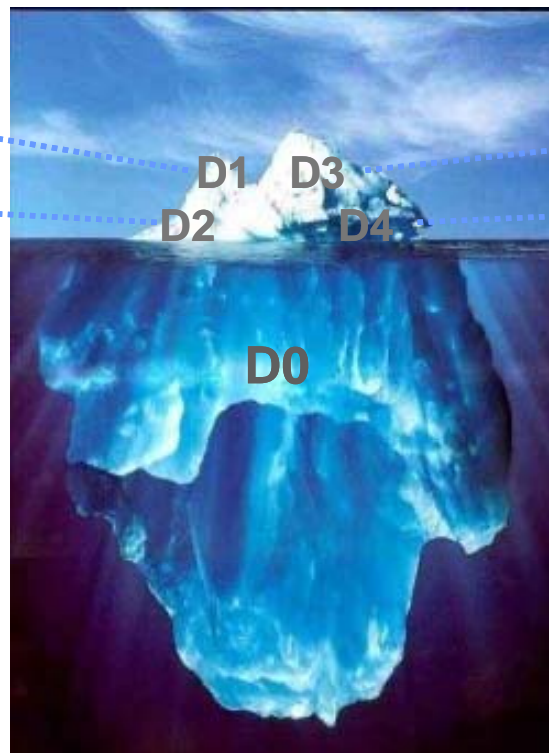


- D0** → Science & Economics Foundations, Policy Costs, & Costs of Inaction
- D1** → Policy Evaluation for Policy-Makers
- D2** → Decision Support for Local Governments
- D3** → Business Risks & Opportunities
- D4** → Citizen & Consumer Ownership



Policy-Makers..

Local Govt's ..



Businesses..

Citizens..

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## For CBD COP-10, Nagoya : Four Requests from TEEB

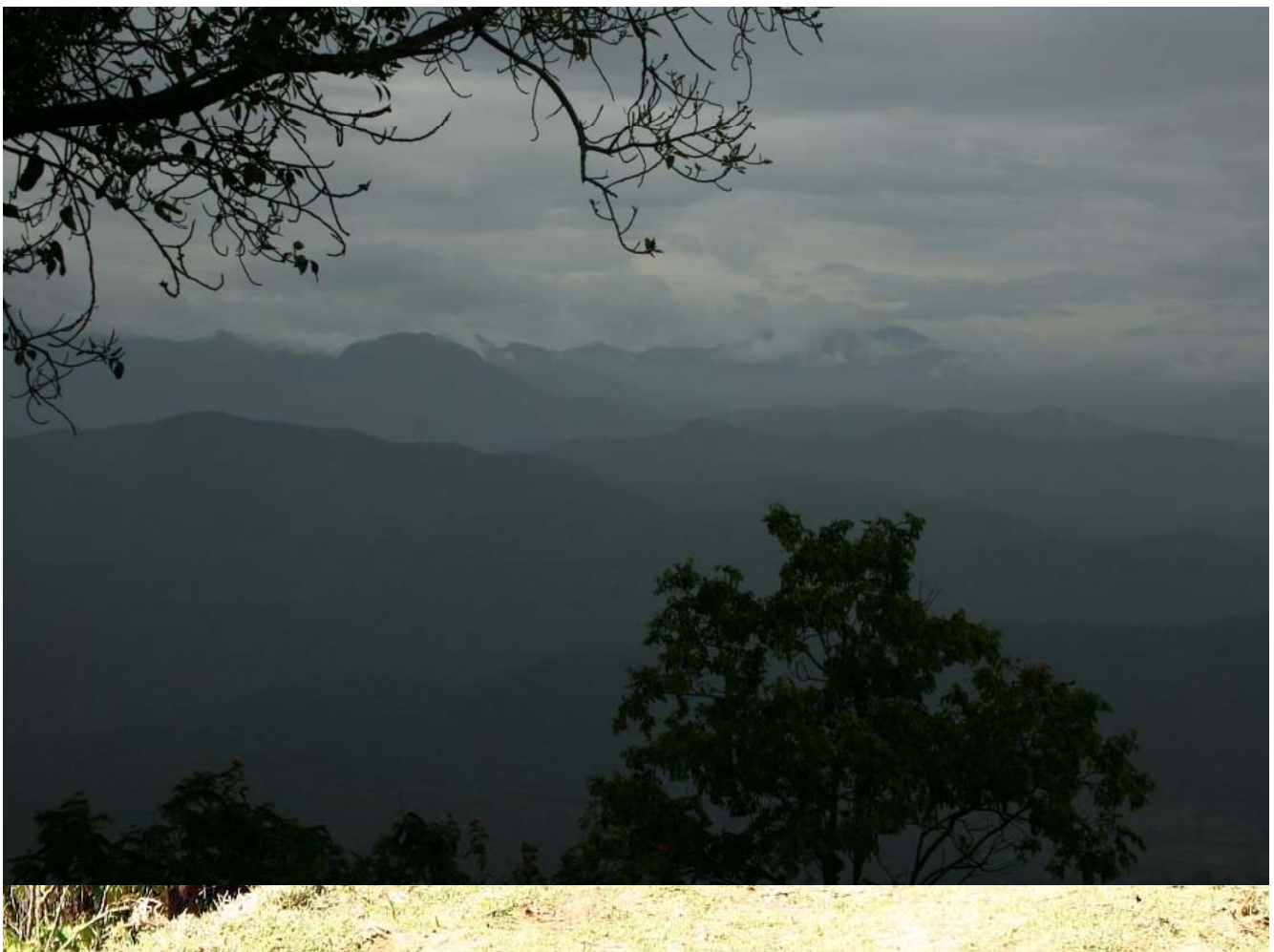
- ❖ **2020 Targets** : Target “**Net Positive Impact on Ecosystems and Biodiversity**” - same direction, different speeds. Use Common Indicators : same indicators, different weights
- ❖ **Coral Reef Emergency** : Formally declare the Global Coral Reef Emergency, and start a set of Regional accords ( eg : “Coral Triangle Initiative” )
- ❖ **Ecosystems & Climate Pavillions** : “Ecosystems & Climate” Pavillion at CBD COP-10, Nagoya, AND at UNFCCC COP-16, Mexico (to promote REDD+, Ecosystem-based Adaptation, Climate impacts on Biodiversity)
- ❖ **TEEB Day** : Launch 5 “TEEB Reports at Nagoya; Showcase TEEB D1/D2 Country Success Stories ; D3 Business Day



**An example of what works  
on the ground and why**

**“Toda” tribals,  
Nilgiris, India**

**Ancient Pastoral Culture**





**Thank you !**

Further information on

[www.teebweb.org](http://www.teebweb.org)

Contact Scientific Coordination: [teeb@ufz.de](mailto:teeb@ufz.de)

