

Value of Ecosystem Services

- Putting the 'green' into green economy -

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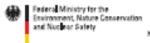
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Nordic Conference on Green Economic Growth 1 March 2012 – Oslo, NO



















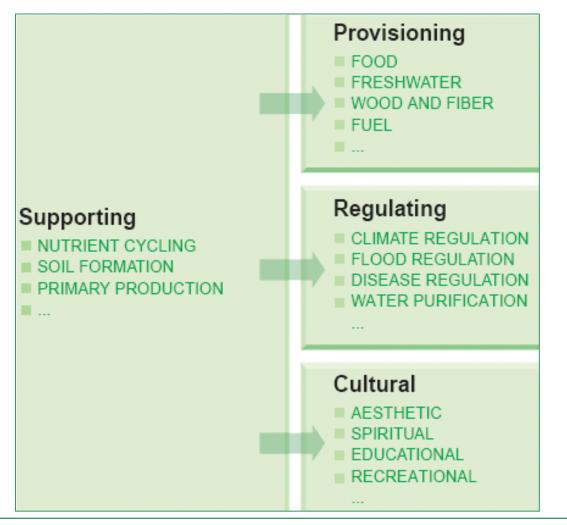






Ecosystem services

- as according to Millennium Ecosystem Assessment 2005 -



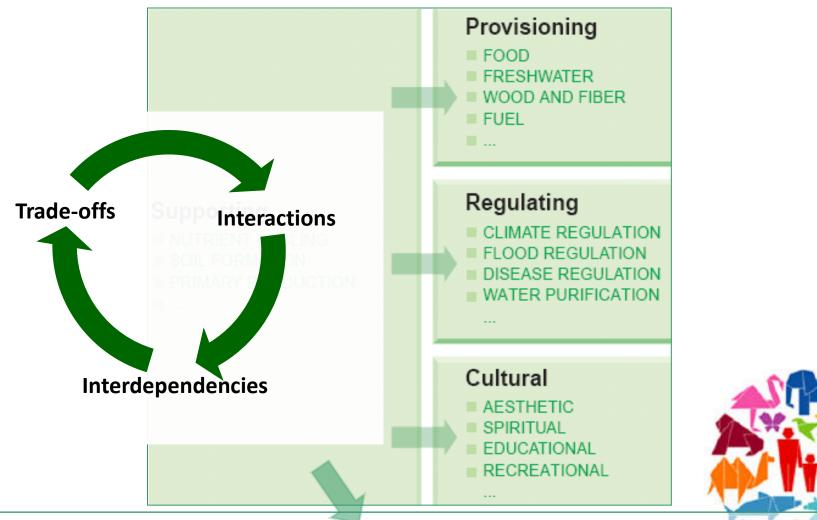


Underpinned by biodiversity (direct & indirect benefits, resilience)



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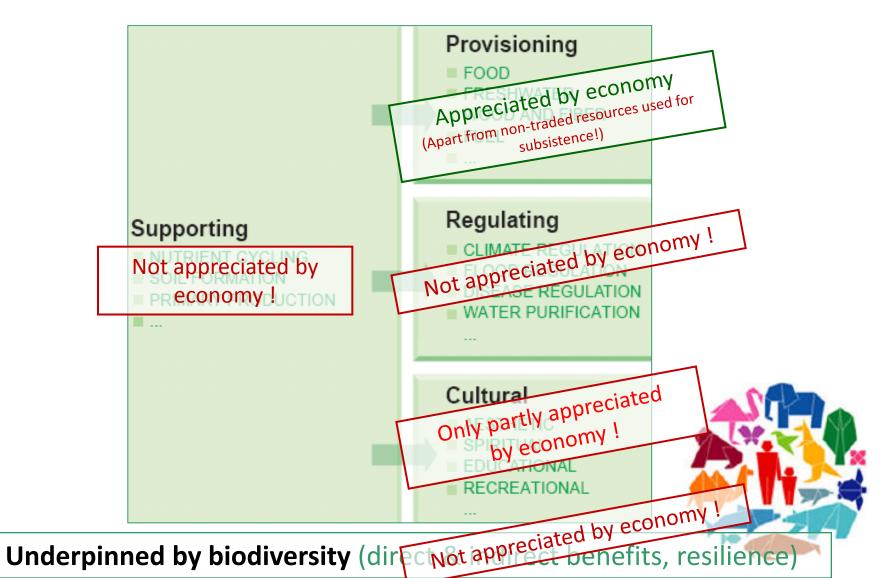


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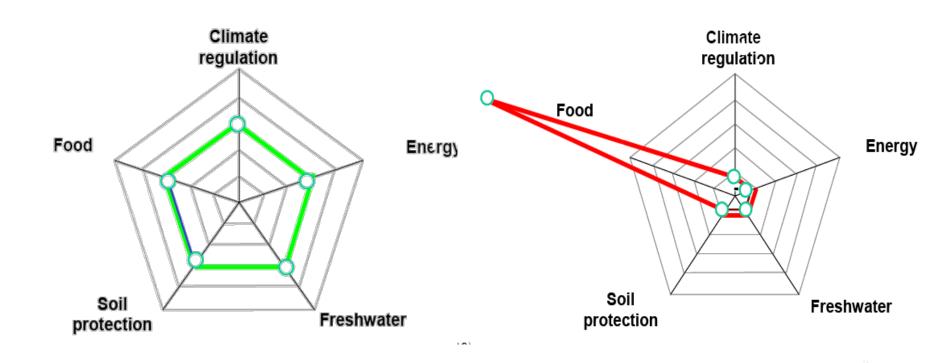


Ecosystem services

- as according to Millennium Ecosystem Assessment 2005 -







Missing full value of nature leads to ...



TEEB initiative (2007 - ongoing): assessing the value of biodiversity & ecosystem services

- •Demonstrate <u>biodiversity</u>, <u>ecosystems & their services have</u> <u>multiple values</u> to economy, society, business & individuals
- Highlight the <u>benefits</u> (vs. costs) of protecting nature & natural capital
- •Show how to assess the value of bd and ES and how it can be used
- •Show how / help to integrate these values into everyday decision-making





Ecosystem services: direct economic values

Global <u>fisheries</u> underperform by US\$ 50 billion annually – due to overfishing (World Bank& FAO 2009).

Global market for eco-labelled fish products grew by over 50% in 2008-2009 (MSC 2009).

Global sales of <u>organic food and drink</u> are increasing by over US\$ 5 billion / year (Organic monitor 2006).

Ecotourism is the fastest growing area of tourism, with estimated increase of global spending 20% annually (TIES 2006).

Conserving forests avoids greenhouse gas emmissions worth US\$ 3.7 trillion (Eliasch 2008).



Ecosystem services: direct & indirect economic values

Economic importance of pollination

- Over 75 % of the world's crop plants rely on pollination by animals
- 30 % of fruits, 7 % of vegetables and 48 % of nuts produced in the EU depend on pollinators
- The annual economic value of insect-pollinated crops in the <u>EU is about EUR 15 billion</u>
- UK: economic value of biotic pollination as a contribution to crop market value in 2007 at EUR 629 million, 2011)
- Loss of pollinators (domesticated & wild) reduces crop yield through reduced and unreliable pollination

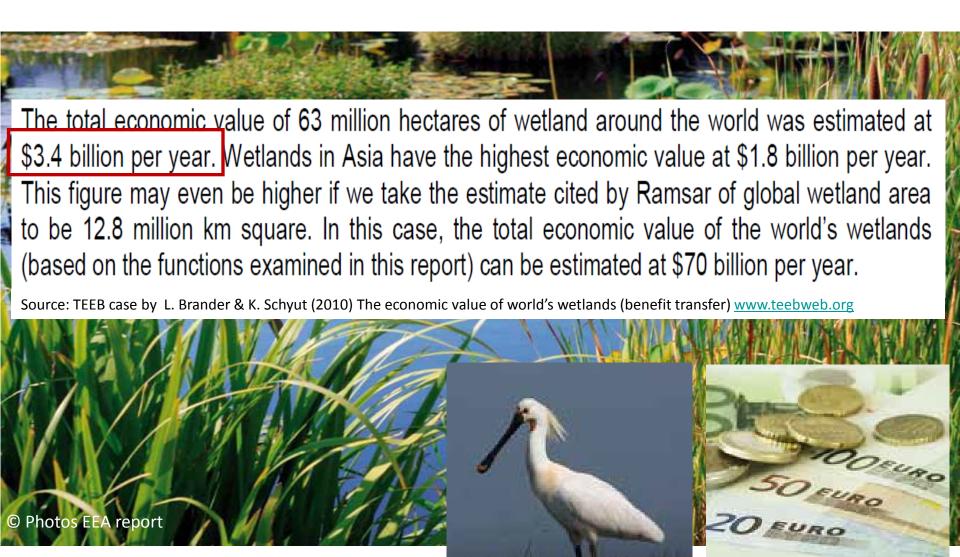


Domesticated pollinator (honey bee)



Wild pollinator (hover fly)

Ecosystem services: direct & indirect economic values



Continued work on ecosystem services ...

- National ecosystem assessments / TEEB initiatives: Brazil, India, Germany, the Netherlands, Belgium, Norway ...
- Thematic initiatives / synthesis: TEEB for Cities, TEEB paper on natural capital & green economy (to be published in Rio), World Bank work on natural capital accounting (WAVES), EEA work on ecosystem accounts ...
- For information & cooperation: please contact Benjamin Simmons UNEP Green Economy / TEEB coordination (benjamin.simmons@unep.org)
- Nordic Council of Ministers activities, e.g.
 - Scoping assessment on the status and value of ecosystem services in the Nordic Countries – TEEB Nordic (May 2011- May 2012)
 - TEEB for municipalities (autumn 2011 spring 2012)
 - Valuing ecosystem services from Nordic watersheds (summer 2011 Dec 2012)
 - Planned outreach activities with UNEP / TEEB in Rio (June 2012)



"A country could cut down all its forest and deplete its natural resources and this would show only as a positive gain to GDP despite of the loss of [natural] capital."

-Robert Repetto (1987) in Millennium Ecosystem Assessment 2005 –



Ecosystem services & truly 'green' green economy

Building green economy on ecosystem services:

- **1.Understanding the value** of nature & natural capital even where the values are not market based.
- **2.Integrating the value** of nature & natural capital into the foundations of decision-making (strategies, plans & regulations, <u>accounting systems</u>, indicators, impacts assessments, tools for landuse planning ...).
- **3.Providing the right economic signals** removing harmful subsidies and creating incentives to sustainable use of natural capital
- **4.→ Investing green** (eg. green infrastructure) & creating green jobs

Understanding & assessing ES stocks, flow & value

Ecosystem service stock

(status & trends)

- Forest & water ... but also:
- Carbon stock
- Stock of pollinators
- Genetic resources
- Stock of natural heritage
- Etc.

Ecosystem service

(status & trends)

- Benefits 'flow'
 between <u>scales</u> (local
 / national / global) in
 <u>time</u> (sustainability)
 and from managers to
 beneficiaries
- Also, several benefits are processes and cannot be expressed as 'stock' only

Ecosystem service value

(current & potential)

- Qualitative
- Quantitative
- Monetary



Trade-offs

Trade









Biodiversity(status & trends)
Indication of resilience!

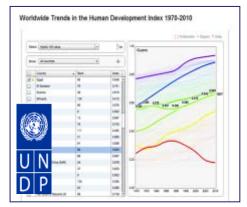
Integrating ES into accounting systems & indicators



ES Stock – Flow – Value Biodiversity

Ecosystem accounts (EA) &
System of Integrated
Environmental and
Economic Accounting (SEEA)

Beyond GDP

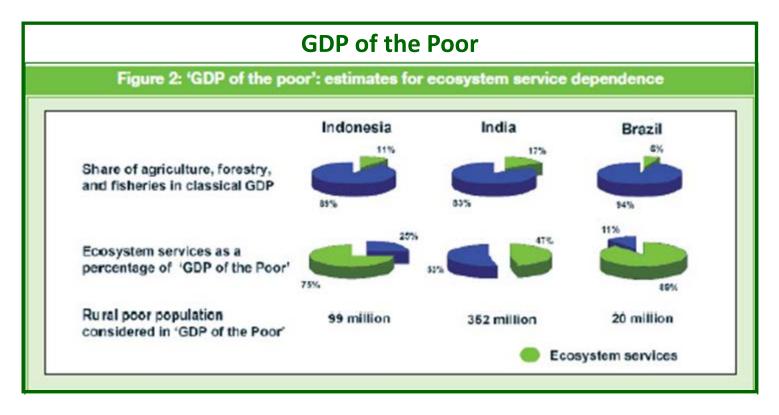




A bundle of greener macroeconomic & societal indicators

Greener economy & sustainable societies





Providing right economic signals: subsidy reform

Subsidies: Over \$1trillion/year: a mix of 'the good, the bad & the ugly'

Sector	Region
Agriculture	OECD: US\$261 billion/year (2006-2008) (OECD, 2009)
Biofuels	US, EU and Canada: US\$11 billion in 2006 (GSI, 2007; OECD, 2008b)
Energy	World: US\$557 billion/year in 2008 (IEA, 2010)
Fisheries	World: US\$15-US\$35 billion/year (UNEP, 2008a)
Transport	World: US\$238-US\$306 billion/year, of which EHS are estimated at US\$173-US\$233 billion/year (Kjellingbro and Skotte, 2005)
Water	World: US\$67 billion/year, of which EHS are estimated at US\$50 billion/year (Myers and Kent, 1998)

(TEEB 2011 Chapter 6: Lehman & ten Brink et al 2011)

Providing right economic signals: incentives

Payments for Ecosystem Services (PES)

Instrument growing in applications

- ■300 PES programmes globally, range of ecosystem services (Blackman & Woodward, 2010)
- ■Global value ~ USD 8.2 billion (Ecosystem Marketplace, 2008; see also OECD 2010)
- ■Increasing by 10-20% per year (Karousakis, 2010)
- Target a range of objectives: water, deforestation, carbon storage, IAS, poverty...

Big & small - public & private

- eg. 496 ha being protected in an upper watershed in northern Ecuador
- eg. 4.9 million ha sloped land being reforested by paying landowners China
- Public (municipal, regional, national) & private (Vittel (Fr), Rochefort (B), Bionade
 (D) for quality water)
- Local (eg. New York, Quito), Regional (eg. Niedersachsen), national (eg. Costa Rica, Mexico and Ecuador and international (e.g. REDD+, ABS)

Conclusions: ecosystem services & green economy

- **Getting the foundations right!** A 'truly green' green economy rests on sustainably managing natural capital → one key element is to green our accounting systems.
- Getting the market signals right! Removing harmful subsidies and providing the right kind of incentives → ecosystem services provide several opportunities for / support to green economy (eg. via PES schemes).
- **Encouraging to invest green!** Investment in natural capital can lead to significant cost savings, creates business opportunities and if appropriately planned and implemented can provide win-wins for both natural resources management and biodiversity conservation.

The true value of nature is not a number with a pound sign in front



George Monbiot guardian.co.uk, Monday 6 June 2011 20.00 BST Article history



Putting a price on nature can't be worse than giving it all away for free

The natural world gives us clean air and water, fertile soils and immense wellbeing. Putting a price tag on it might just stop us mistaking free for worthless

DAMIANCARRINGTON'S ENVIRONMENTBLOG

Posted by Damian Carrington Thursday 2 June 2011 10.02 BST guardian.co.uk





Thank you

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This presentation builds on the work carried out in the context of **TEEB for National and International Policy-makers (2011)**

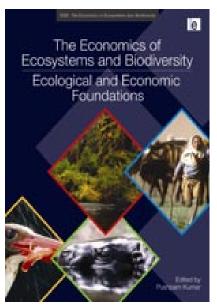


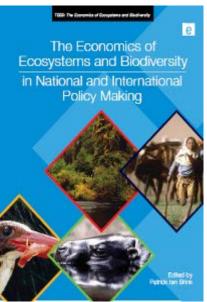
IEEP is an independent, not-for-profit institute dedicated to the analysis, understanding and promotion of policies for a sustainable environment in Europe.

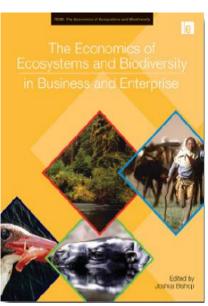
See IEEP Manual of European Environmental Policy: http://www.europeanenvironmentalpolicy.eu/











TEEB books: http://www.routledge.com/sustainability/

TEEB reports & general info: http://www.teebweb.org/

TEEB coordination / UNEP: benjamin.simmons@unep.org

Examples: ecosystem service -based Green Economy

Business opportunities: payments for ecosystem services (PES)

- Situation: Vittel natural mineral water (FR)
 depends on high quality water from Vosges
 Mountains (no pre-treatment allowed by law).
- Assessment: Costs of managing upstream ecosystems in a manner that guarantees continued supply of clean water are lower than the costs of moving the sourcing of water elsewhere.
- **Outcome**: Farmers upstream are paid to adopt best low-impact farming practises.
- See CBD Technical Series Report 56 for further examples: http://www.cbd.int/doc/publications/cbd-ts-56-en.pdf



Examples: ecosystem service -based Green Economy

Cost savings: flood management (regional)

- **Situation**: The Napa River Basin (California) suffers from frequent flooding.
- Assessment: Levees & channel modification to prevent flooding were deemed unsustainable by the citizens (eg with several negative impacts to water quality)
- Outcome: A comprehensive flood control plan to restore river's original capacity to handle flood waters was adopted. Significant mitigation of damages and over <u>US\$ 1.6 billion</u> savings in flood protection.



Benefits from protected areas: food security



Protected areas are a 'live' gene bank for our cops, fruits and vegetables







Benefits from protected areas: food security

Marine Protected Areas (MPAs) can support the recovery of fish stocks.

A review of 112 studies in 80 MPAs: fish populations, size & biomass all dramatically increased inside reserves, allowing spill-over to nearby fishing grounds. (Halpern 2003)

Note: Need to address shortterm costs of restricted access before long-term benefits arise

