



Capitalising on Natural Resources: New Dynamics in Financial Markets



The Economics of Ecosystems and Biodiversity (TEEB):

A step towards Biodiversity Markets?

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On behalf of Pavan Sukhdev, Deutsche Bank
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10 September 2008, Rüschtikon



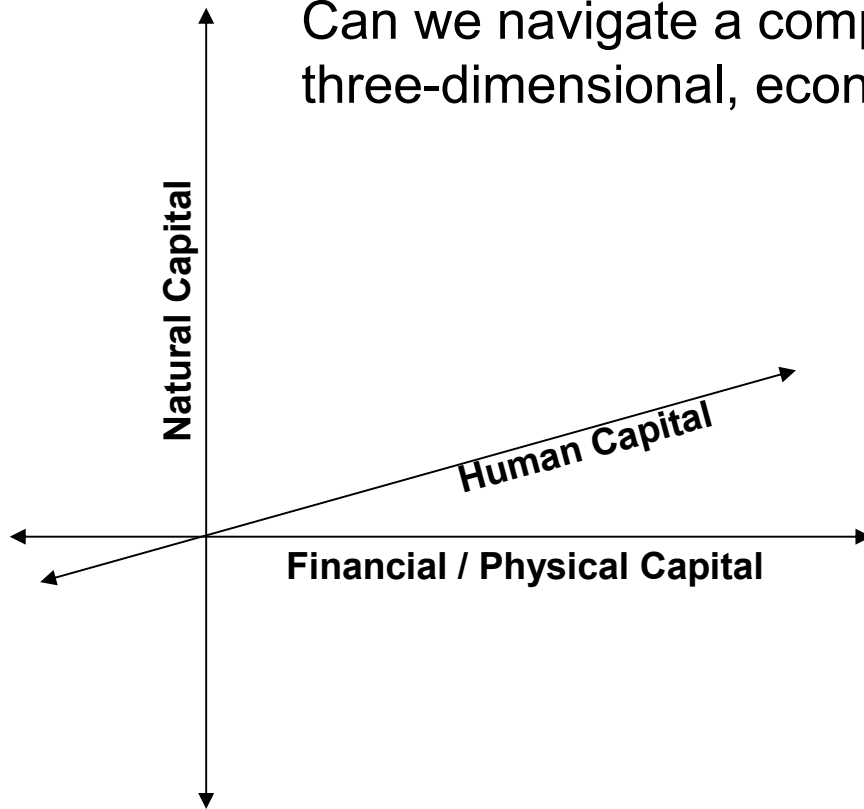
TEEB, & Today's Topic...

- TEEB Background & Objectives
- TEEB Phase I
- TEEB Phase II
- Biodiversity Markets



Navigation Challenge Ahead

Can we navigate a complex, three-dimensional, economic space ...



... with a simple economic compass ?



TEEB : Objectives

Objectives – Phase I & II

Disclose the global economic values of biodiversity and ecosystem services

- Evaluate available analytical economic frameworks and valuation methodologies with which to value ecosystems and biodiversity
- Evaluate the ethical choices implicit in our approach
- Present a spatially-detailed global evaluation based on the above
- Estimate and forecast the costs of policy inaction / “business as usual”



Objectives – Phase II

Substantiate the linkages & support the achievement of the MDG's

- Evaluate and quantify the vulnerability of societies, especially the poor, to ecosystem & biodiversity losses
- Identify & evaluate stakeholder finance & compensation mechanisms to promote biodiversity & ecosystem maintenance, target sustainable livelihoods

Support “End-users” of the economics of ecosystems and biodiversity

- a) governments - to enhance national accounting, improve policy frameworks, support local decision-making, target sustainable growth
- b) businesses - to redefine corporate performance, recommend improved and mainstreamed externality reporting, expand mitigation opportunities
- c) consumers – to mainstream individual & consumer goods footprints



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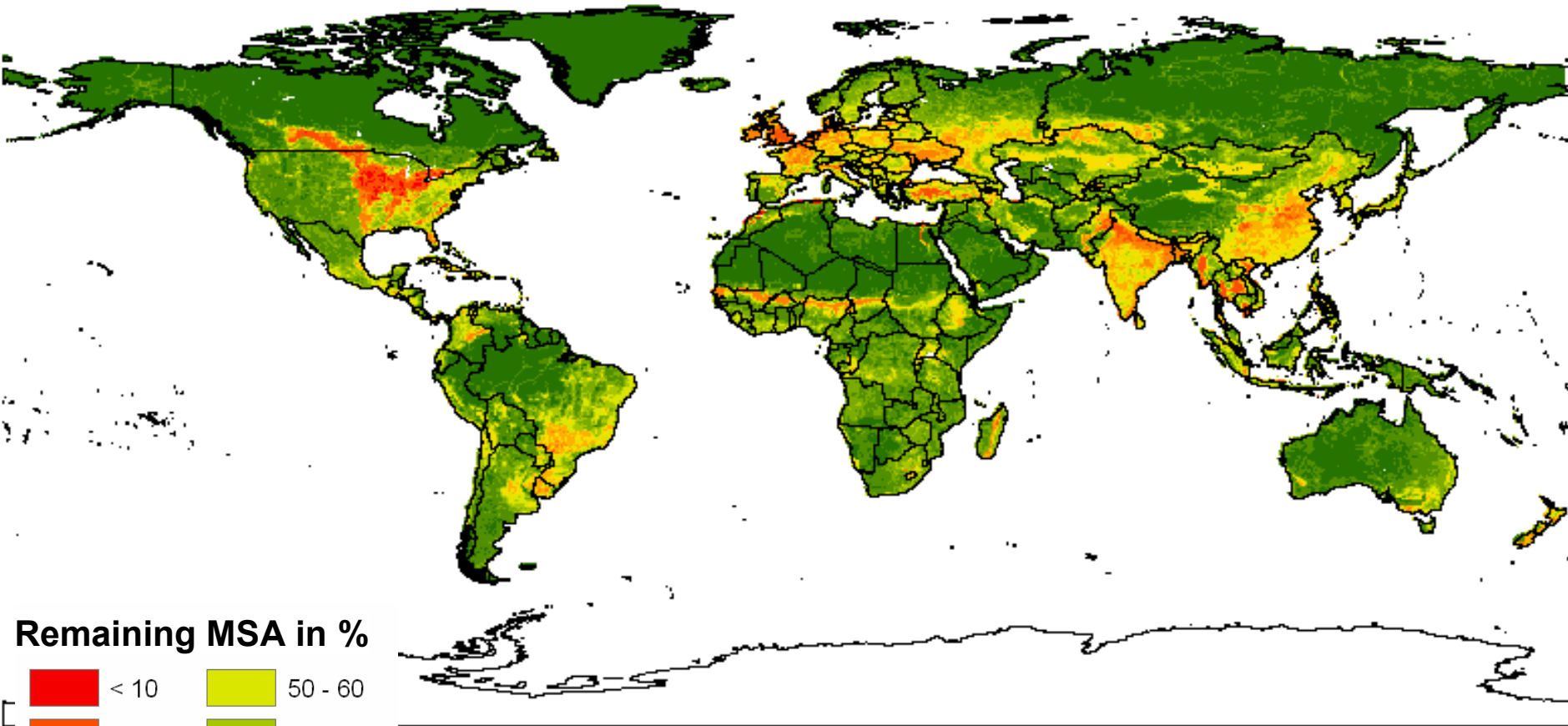


TEEB – Interim Report Released at COP-9, Bonn, May 2008

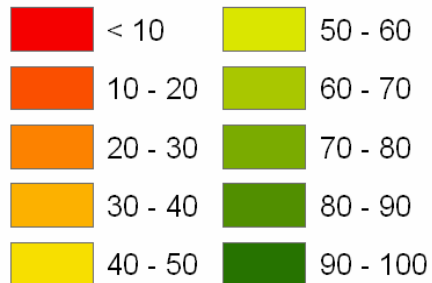


Biodiversity in the World in 2000

The Mean Species Abundance (MSA) indicator



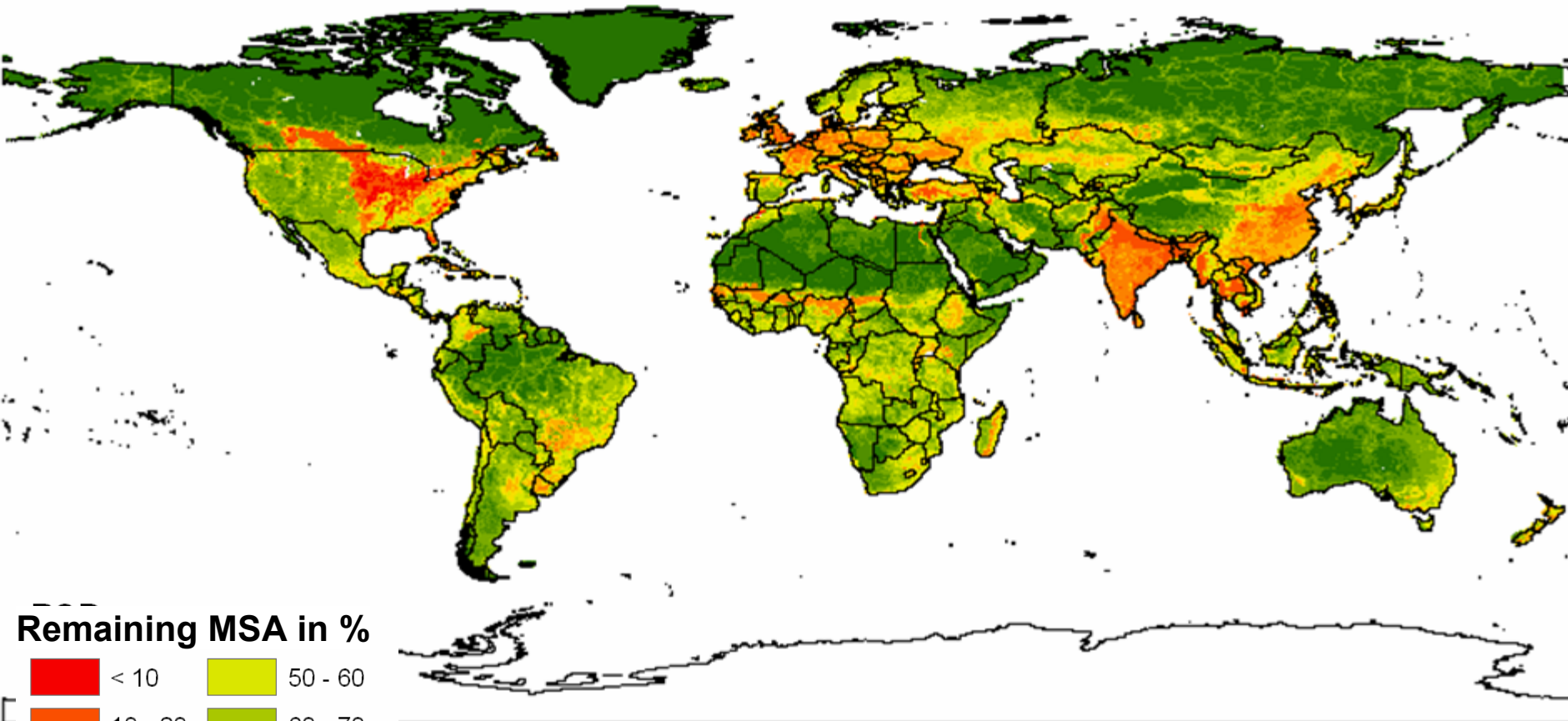
Remaining MSA in %



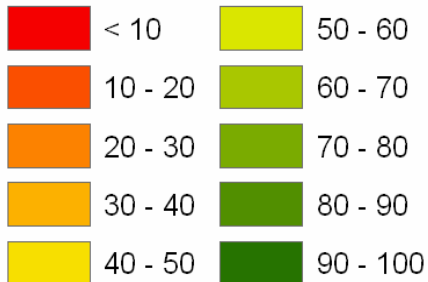
- ❖ MSA is measured versus potential (100%)
- ❖ MSA excludes exotics

Biodiversity in the World in 2050

Future scenario : using OECD/ Globio-3



Remaining MSA in %



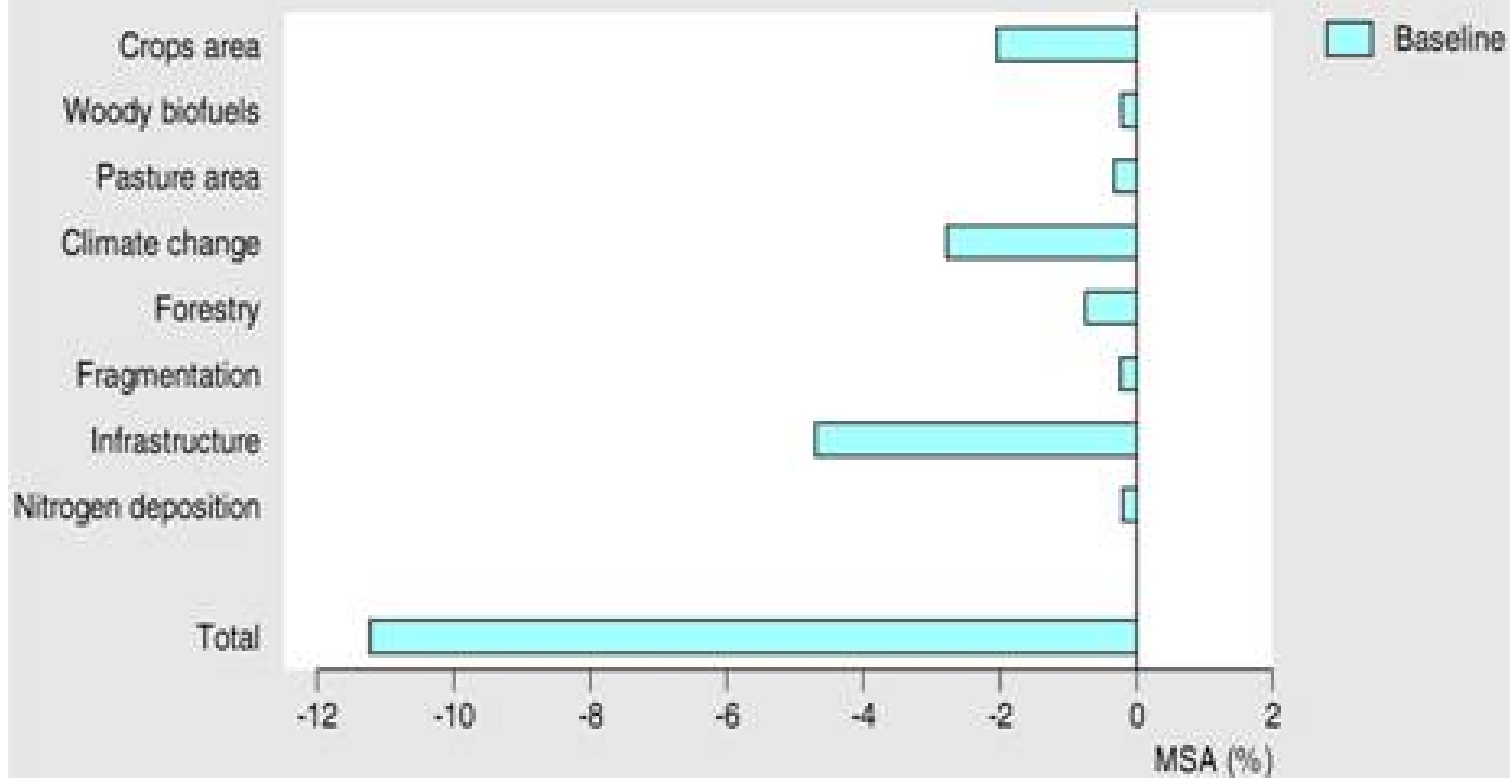
❖ MSA loss from 72% to 61%

❖ Natural Areas decline by 7.5 Million Sq. Km.



Drivers of Biodiversity Loss 2000 - 2050 (Globio-3)

Biodiversity (MSA) loss between 2000 and 2050 and contribution of pressures: World

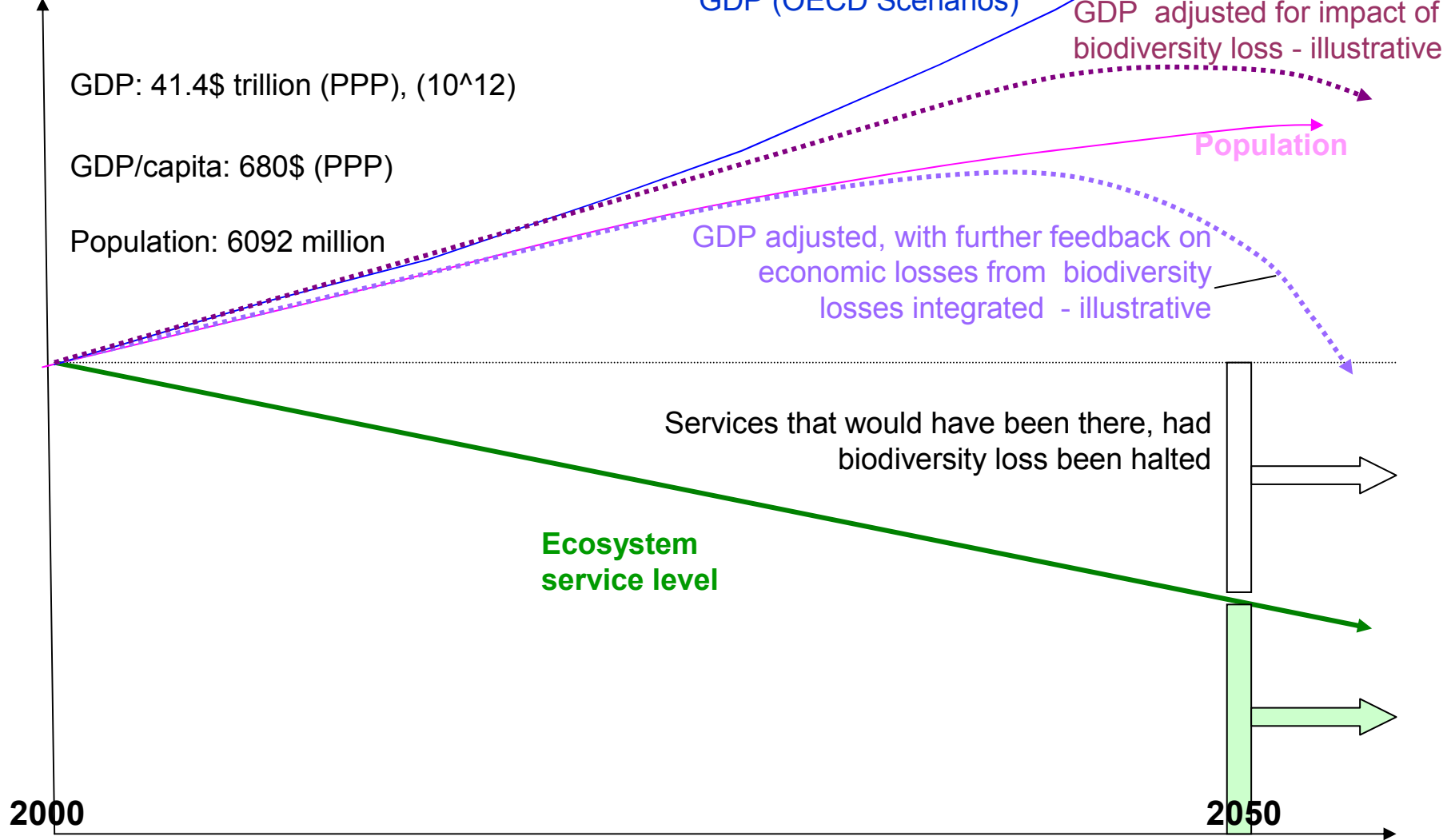


COPI Figure 4.4a : Contribution of different pressures to the global biodiversity loss between 2000 and 2050 in the OECD baseline

Date: 20-jun-2007

(1) Ecosystem service losses: Impacts on human welfare

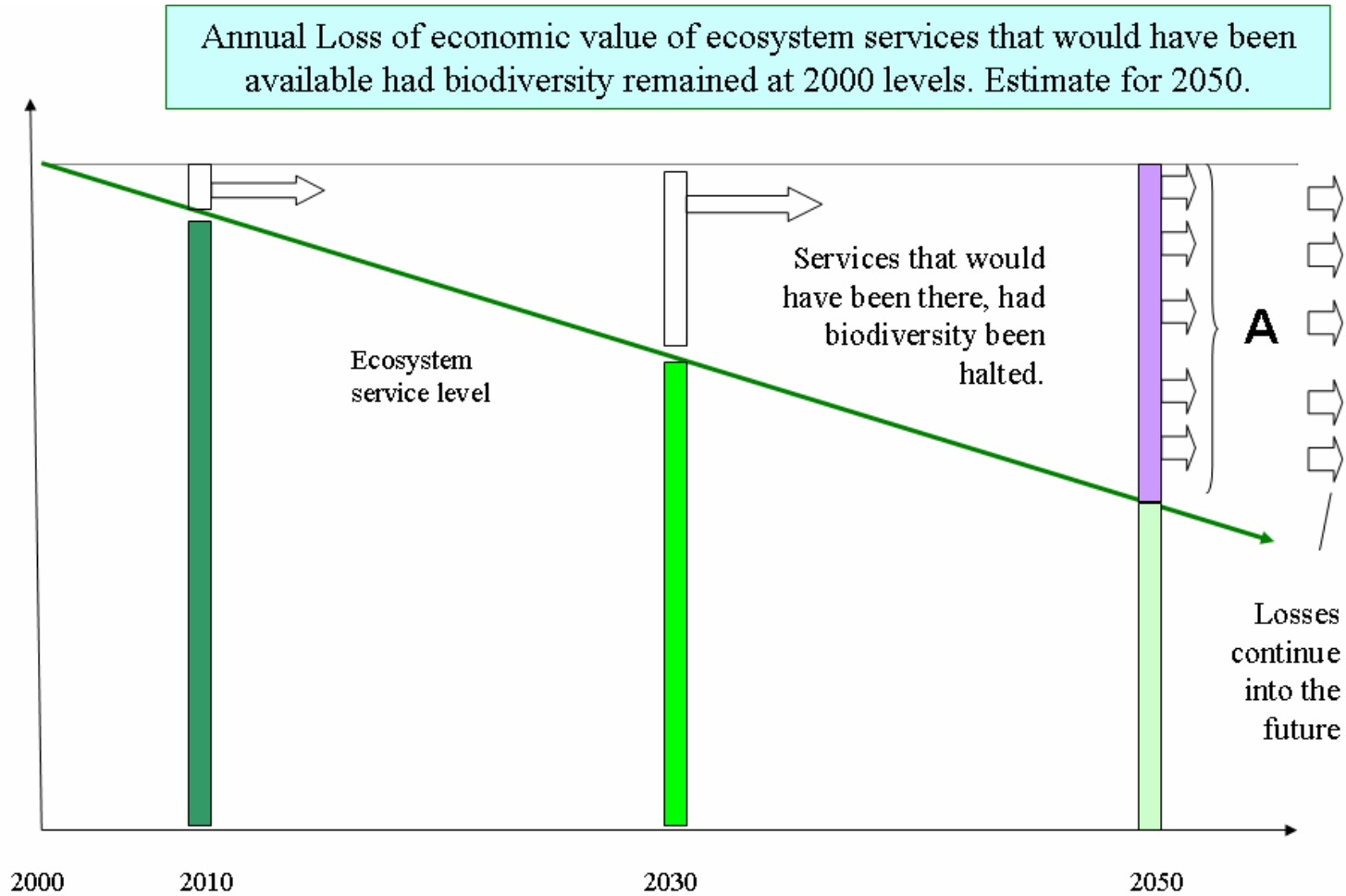
Relative to 2000





(1-cont'd) Large Welfare Losses Forecast

(just from business-as-usual *Forest losses*,
& valuing only 8 of 18 forest services)



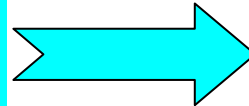
Welfare loss equivalent to 6 % of global GDP per annum, horizon 2050



(2) Three Hidden Stories of “Discounting” Revealed

1. Declining per-capita flow of nature’s services ... *implies that discount rates should be negative?*
2. Marginal Utility of \$1 to the Rich versus the Poor *is too different to merit the same discounting treatment*
3. Inter-generational Equity*following ‘market practice’ means valuing nature’s utility to your grandchild at one-seventh of your own*

Most of the 29 valuation studies in our meta-study of forest valuations use discount rates between 3%-5%

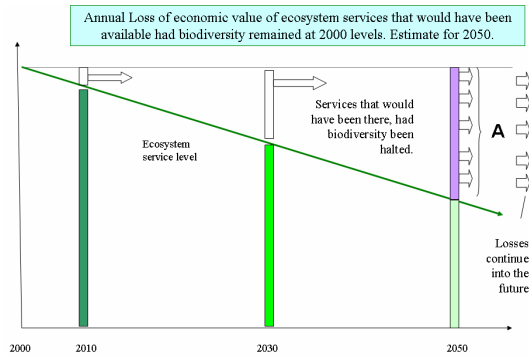


Cash flow 50 years in the future	Annual discount rate	Present value of the future cash flow
1,000,000	4%	140,713
1,000,000	2%	371,528
1,000,000	1%	608,039
1,000,000	0%	1,000,000



(2 cont'd) : Losses in 'Present Value' terms... (COPI study, May 2008, TEEB)

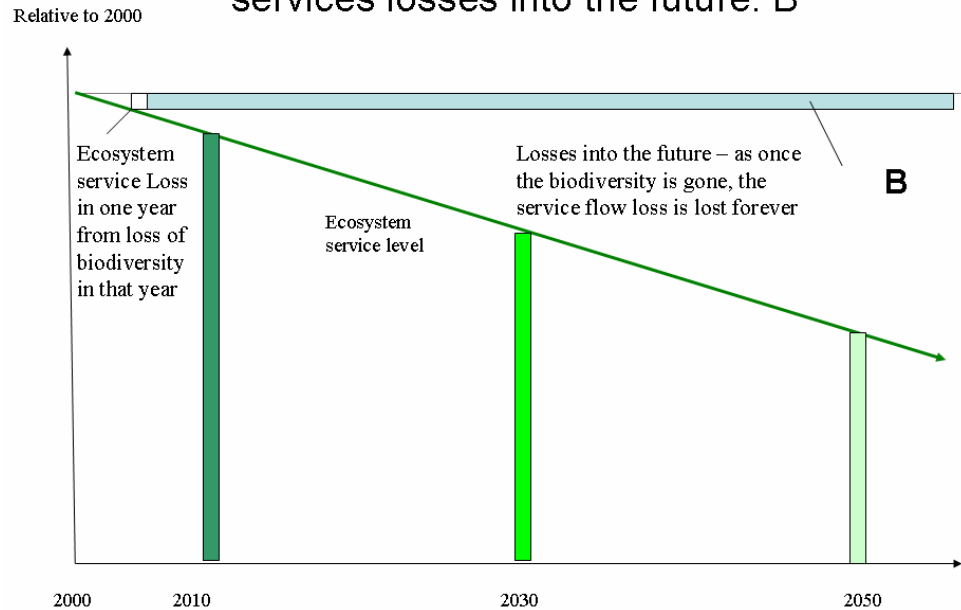
A : 50-year impact of inaction or 'business as usual'



Welfare loss equivalent to 6 % of GDP, horizon 2050

B : Natural Capital Loss every year

Valuation and Ecosystem service losses
A year's biodiversity loss leads to ecosystem services losses into the future: B



**Natural Capital Lost : Annually
EUR 1.35×10^{12} to 3.10×10^{12}**

@ 4%

@ 1%



(3) Losses of Ecosystem Services seriously jeopardize Poverty Alleviation

TEEB “Interim Report” spells out the direct links between Biodiversity loss & Ecosystem degradation and the risks of failure on ALL EIGHT Millennium Development Goals, not just MDG 7 (Environment)





(3 – cont'd) Haiti Example : Ecosystem Losses and Links to MDG's 1, 4, 5, 8...

- **Haiti was once fully forested; less than 3% cover remains today.**
- **Poorest country in the Western Hemisphere; 65% of its people must survive on less than \$1 a day.**
- **From 1950-1990, the amount of *arable land* almost halved due to soil erosion.**
- **Deforestation has diminished evaporation back to the atmosphere over Haiti; total rainfall in many locations has declined by as much as 40%, reducing stream flow and irrigation capacity.**
- **Avezac Irrigation System only supports half of the 9,500 acres it was initially designed to cover.**
- **When it rains, hillsides no longer efficiently retain or filter water - even moderate rains cause devastating floods.**
- **Ground and stream waters are laden with sediment and pollution, which has degraded estuarine and coastal ecosystems.**
- **about 90% of Haitian children are chronically infected with intestinal parasites that they acquire from the water they drink.**

MDG 1: Eradicate extreme poverty and hunger

MDG 5: Improve maternal health

MDG 4: Reduce child mortality



(3 – cont'd) the “GDP of the Poor” is most seriously impacted by ecosystem losses

- **“India” Example, 2002-03 data, GAISP**
- **540 Million people engaged in farming, animal husbandry, informal forestry, fisheries**
- **Ecosystem services add “only 7.3%” to classical GDP**
- **But add 57 % to “GDP of the Poor”**
- **Replacement of those ecosystem services is beyond the capacity of the poor**

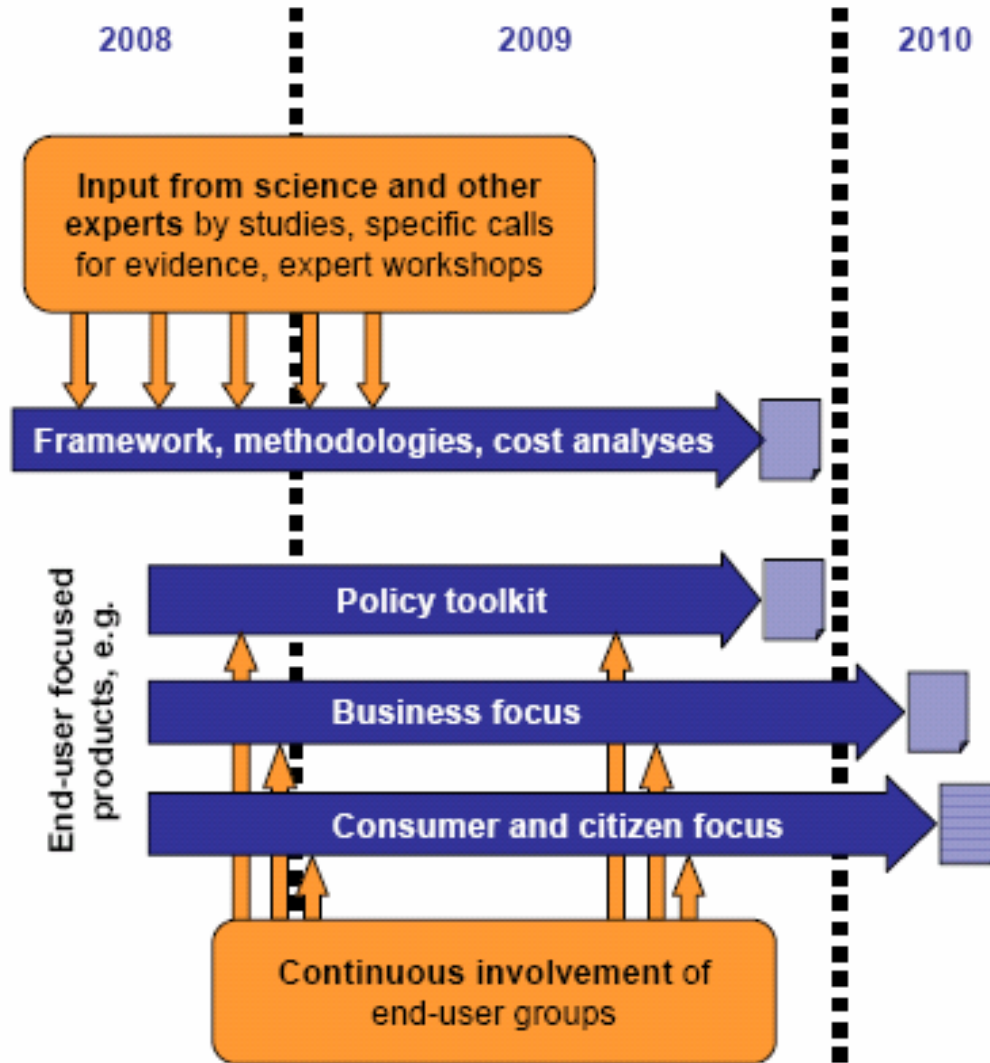


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TEEB – Phase II (“Mainstreaming”) Timelines and Deliverables





Elements of Phase II 'D0' (Valuation Framework, Methodology, Scenarios)

Phase II to include further work on:

- **Ecosystem dynamics**, especially for regulating services
- **Option values**, e.g. bio-prospecting
- **Ecological thresholds**....and the limits of economic analysis
- **Resilience** values of biodiversity
- Recommendations for valuing **bequest values, existence values**
- **Urban biodiversity**... e.g. pollution mitigation, recreation, pollination
- **Agricultural biodiversity**... not sufficiently covered in Phase I
- **Discount rate ranges** to assess sensitivity to **ethical choices**
- Biomes not covered in Phase I (e.g. **oceans, coral reefs, polar**)



Some elements of Phase II 'D3' (Business Impacts & Opportunities)

Phase II to include further work on:

- Business tools to **identify biodiversity risks and liabilities**
- The concept of “**no net loss**” or “**net positive impact**” on biodiversity
- **Biodiversity business opportunities**... e.g. eco-agriculture, eco-tourism, certified forestry, biocarbon, biodiversity banking
- Bringing business skills to conservation via **public-private partnerships**
- Mainstreaming ecosystems in corporate **management and reporting**
- Environmental regulation for **pricing ecosystem assets and liabilities**
- How business can help build a **green economy and green jobs**



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Rewarding Unrecognized Benefits

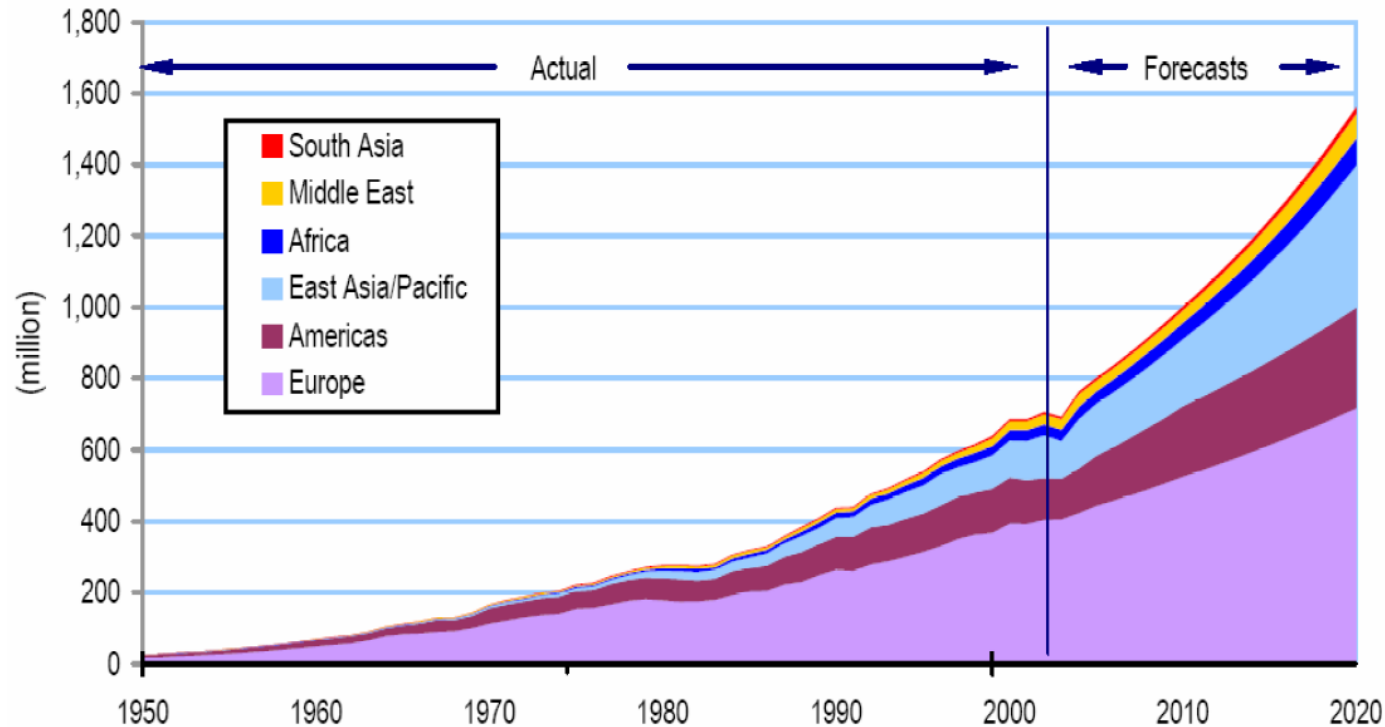
- **Panama Canal** : Insurance firms and shipping companies are financing a 25-year project to reforest the catchment above the canal to secure / restore freshwater flow to its locks... the fear of loss due to closures of the Canal had been making shipping insurance premiums mount
- **Costa Rican PES** : Payments for Environmental Services are virtually a national strategy for forest and biodiversity conservation and sustainable development
- **Guyana** : A Private Equity firm recently bought the rights to environmental services from a 370,000 hectare rainforest reserve in Guyana, anticipating that its services (carbon and water storage, biodiversity maintenance, rainfall regulation, etc) will gain value over time. Revenues will be shared 80% with the local communities.

These are just a selection of the many examples we encountered ...



Nature-based recreation: A large and growing market

International Tourist Arrivals (1950-2020)



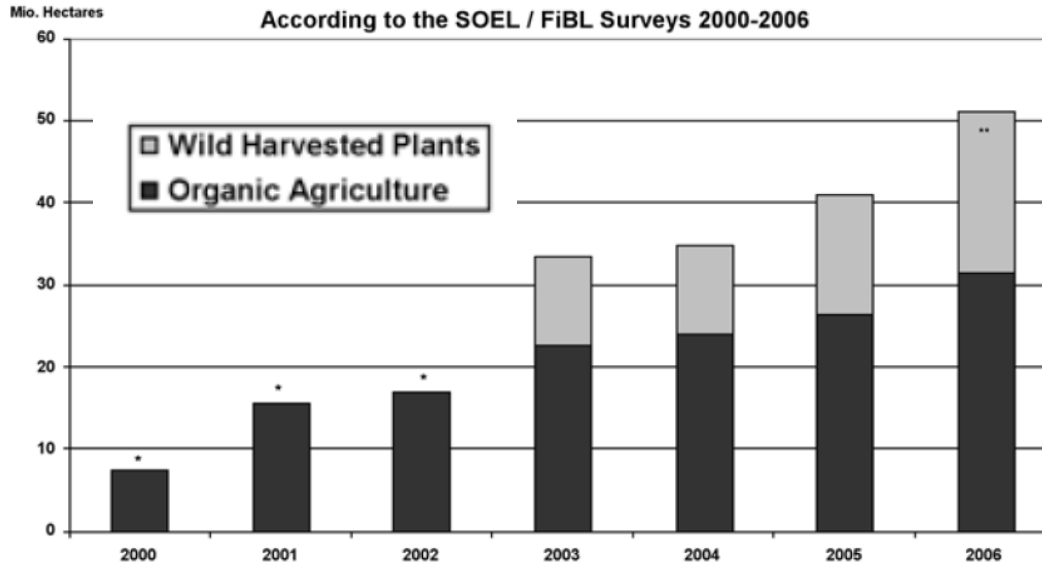
Eco-Tourism is “the fastest growing sector of the largest industry on earth”, with annual exports up to **US\$100 billion** and growing **three times faster** than other segments of the tourism sector (www.world-tourism.org, www.ecotourism.org)



Making markets with information: Certification and eco-labelling

Organic agriculture: 30 million hectares and US\$38 billion in 2006

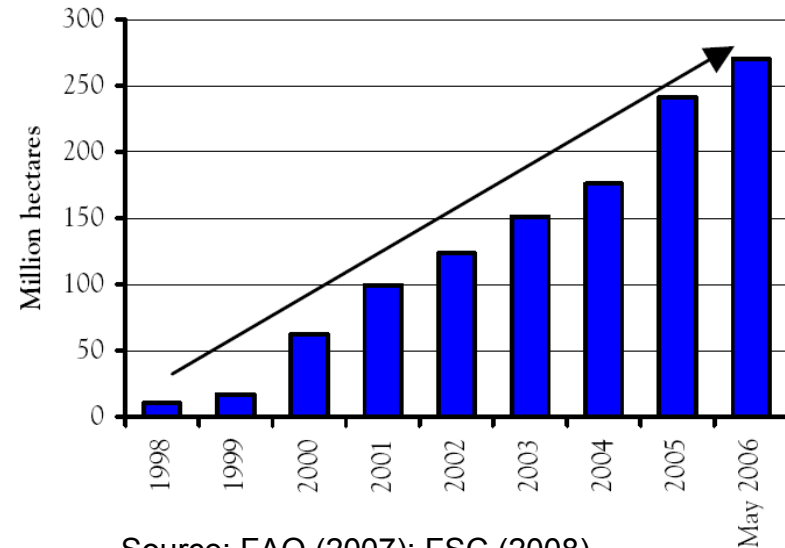
Area of Organic Agriculture and Wild Harvested Plants Worldwide According to the SOEL / FiBL Surveys 2000-2006



Source: Willer et al. (2008)

Certified forestry: 7% of productive forest area and US\$20 billion sales in 2007

Certified forest area worldwide, 1998-2006



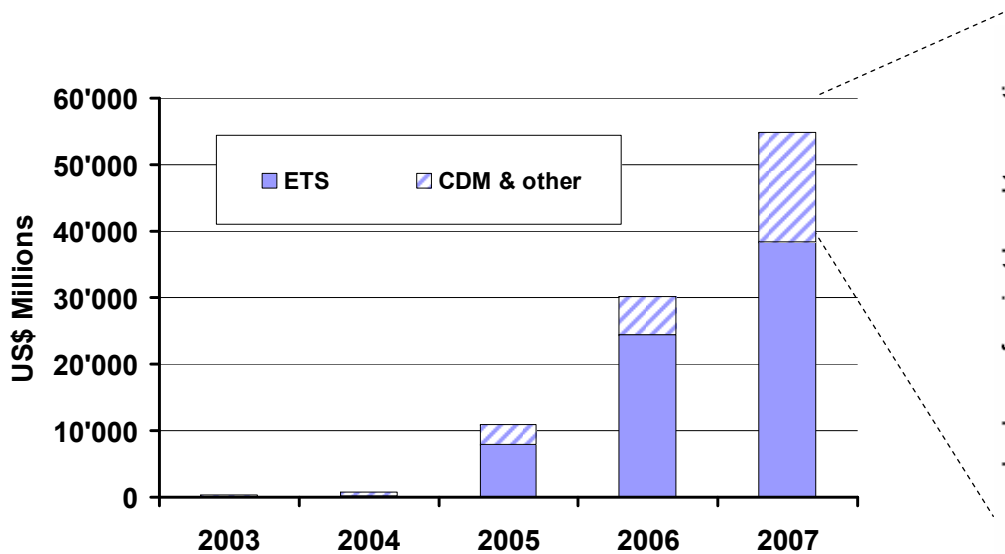
Source: FAO (2007); FSC (2008)



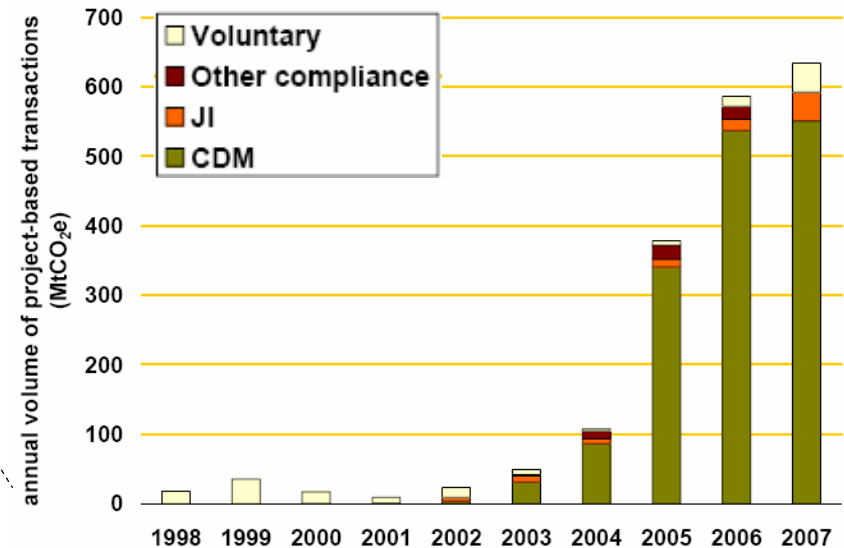


The carbon trade and bio-carbon offsets

Global Carbon Trade



Project-Based Carbon Offsets



“Investors all over the world have pumped around \$66 billion into more than 200 newly launched mutual funds and exchange traded funds investing in companies that help to mitigate or adapt to climate change” (Deutsche Asset Management, 2008)

Sources: World Bank (2007); Point Carbon (2008); Financial Times (24.03.2008)



Biodiversity offsets: An emerging market

What are biodiversity offsets?

- Like-for-like compensation for residual loss or damage resulting from development

From biodiversity offsets to biodiversity markets

- In some cases, developers can purchase biodiversity “credits” from third parties for similar ecosystems/habitat in the surrounding area



Biodiversity offsets: An emerging market

Where are biodiversity offsets currently used or being developed?

- **USA:** Federal Clean Water Act, Endangered Species Act
- **Australia:** Victoria, NSW, Western Australia
- **Brazil:** Protected Areas Law, Forestry Code
- **Canada:** Fisheries Act
- **Mexico:** Protected Areas Law, Forestry Law
- **South Africa:** Western Cape draft provincial guidelines
- **Switzerland:** Federal Law for Protection of Nature & Landscape
- **EU:** Habitats Directive, Environmental Liability Directive
- **Global:** World Bank, International Finance Corporation
- **Voluntary:** ICCM, Anglo American, Newmont, Shell, BP, Eni, Chevron Texaco, Statoil, Walmart, DuPont, Rio Tinto



Experience of biodiversity offset markets

Wetland Banking : USA – agencies, companies or individuals buy environmental credits from Wetland Mitigation Banks to compensate for degradation of wetland ecosystems due to agriculture or development. Over 400 banks established, the majority by private entities. Market worth over \$3 billion, last year it transacted \$750 million.

Endangered Species Credits : USA - A biodiversity cap-and-trade system for ‘endangered species credits’, which can be used to offset a company’s negative impacts on habitat for threatened species.

Bio-Banking : Australia – a pilot project in New South Wales to create financial incentives for protecting private land with high ecological value. Developers buy “biodiversity credits” to offset negative impacts on biodiversity. These credits can be created by enhancing or permanently protecting land.

.... but to be really successful, these markets need appropriate institutional infrastructure, incentives, financing and governance: in short, investment.



Thank You !