



Green Week  
The value of biodiversity & ecosystems  
Brussels, 4<sup>th</sup> June 2008



# The Economics of Ecosystems and Biodiversity (TEEB)

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**The Economics of Ecosystems and Biodiversity (TEEB)**

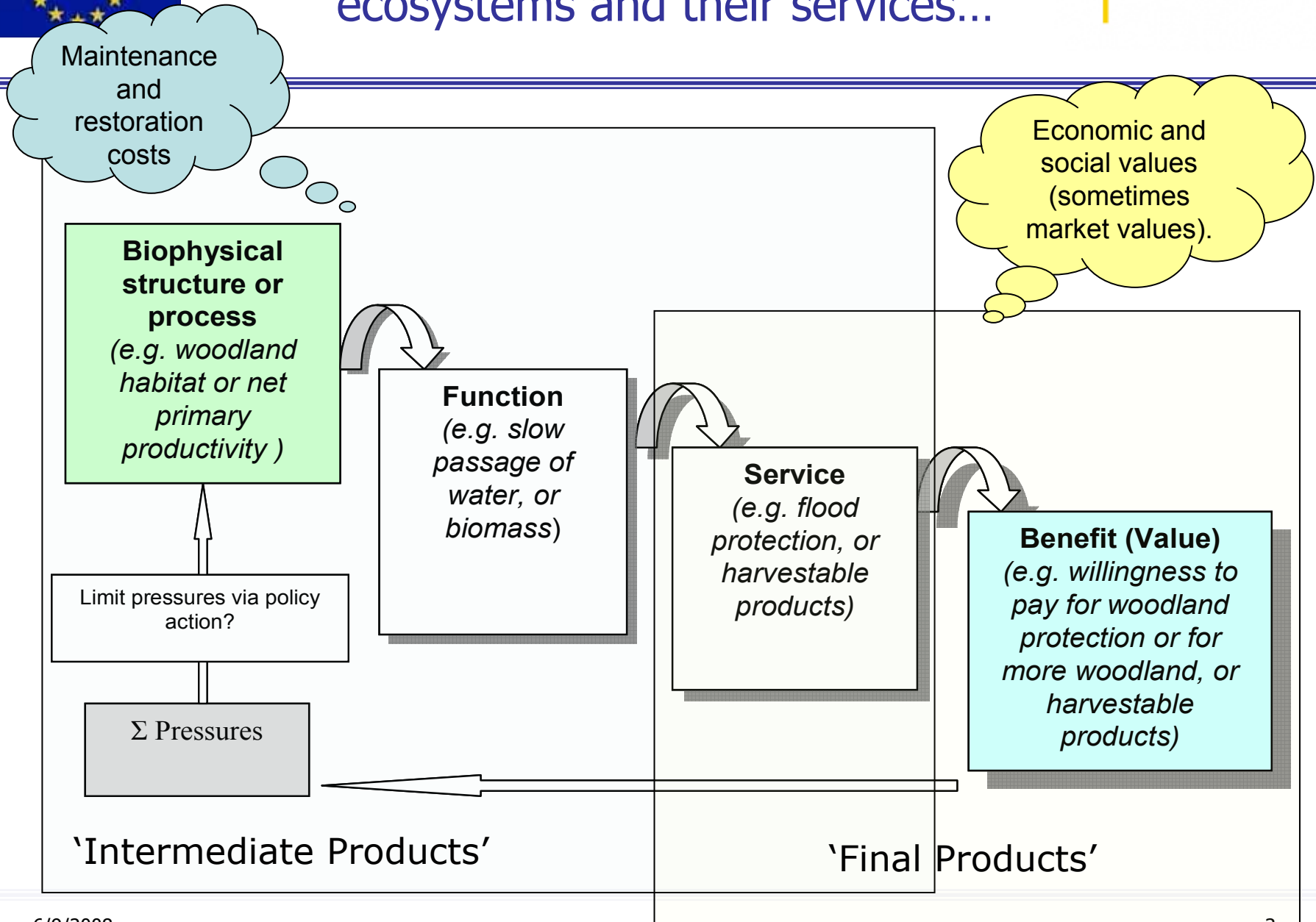


# Today's Subjects...

- ❑ The links : Biodiversity, Ecosystems, Functions, Benefits, and Values
- ❑ The ecological challenge : *modelling and measuring ecosystem functions*
- ❑ The valuation challenge : *from demonstrating value to capturing value*
- ❑ The ethics challenge : *discounting !*

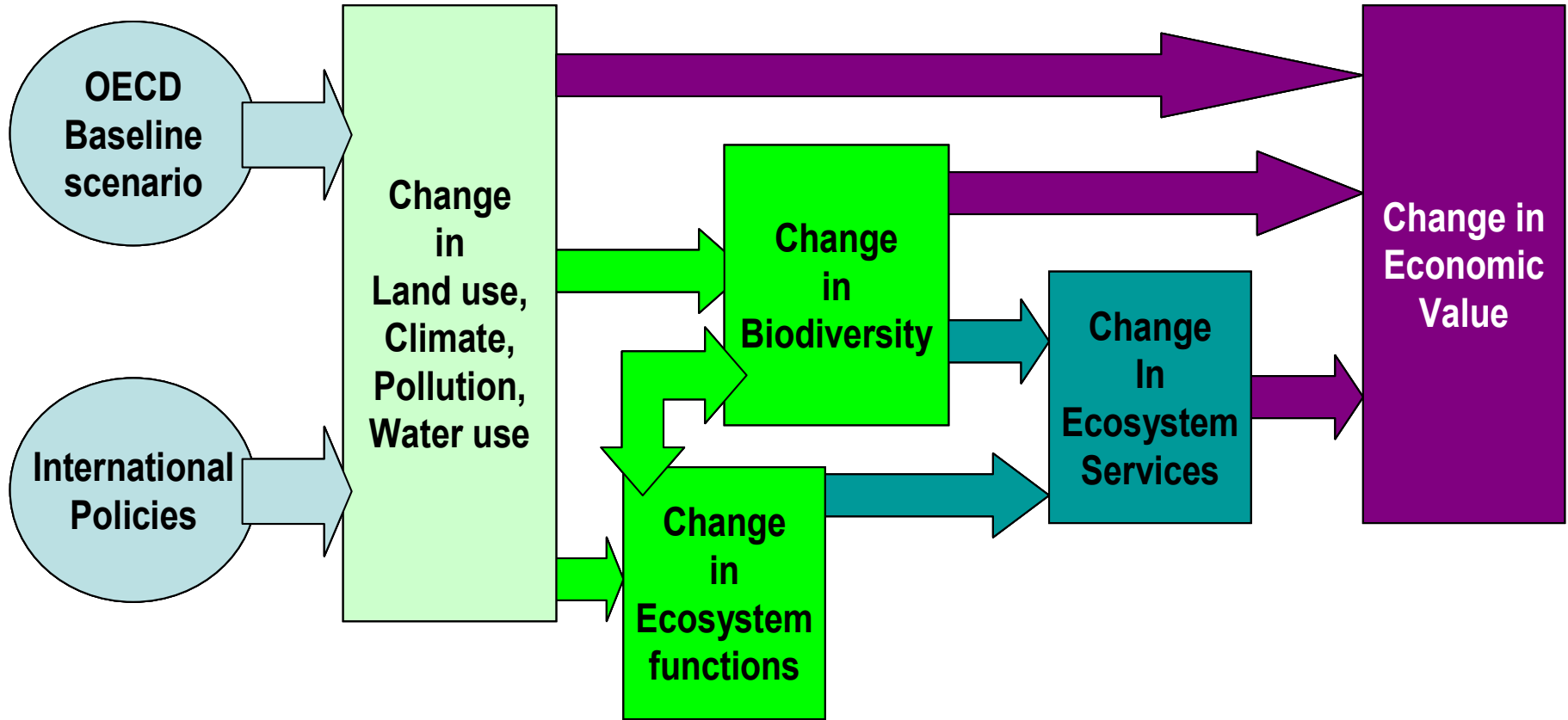


# The link between biodiversity, ecosystems and their services...

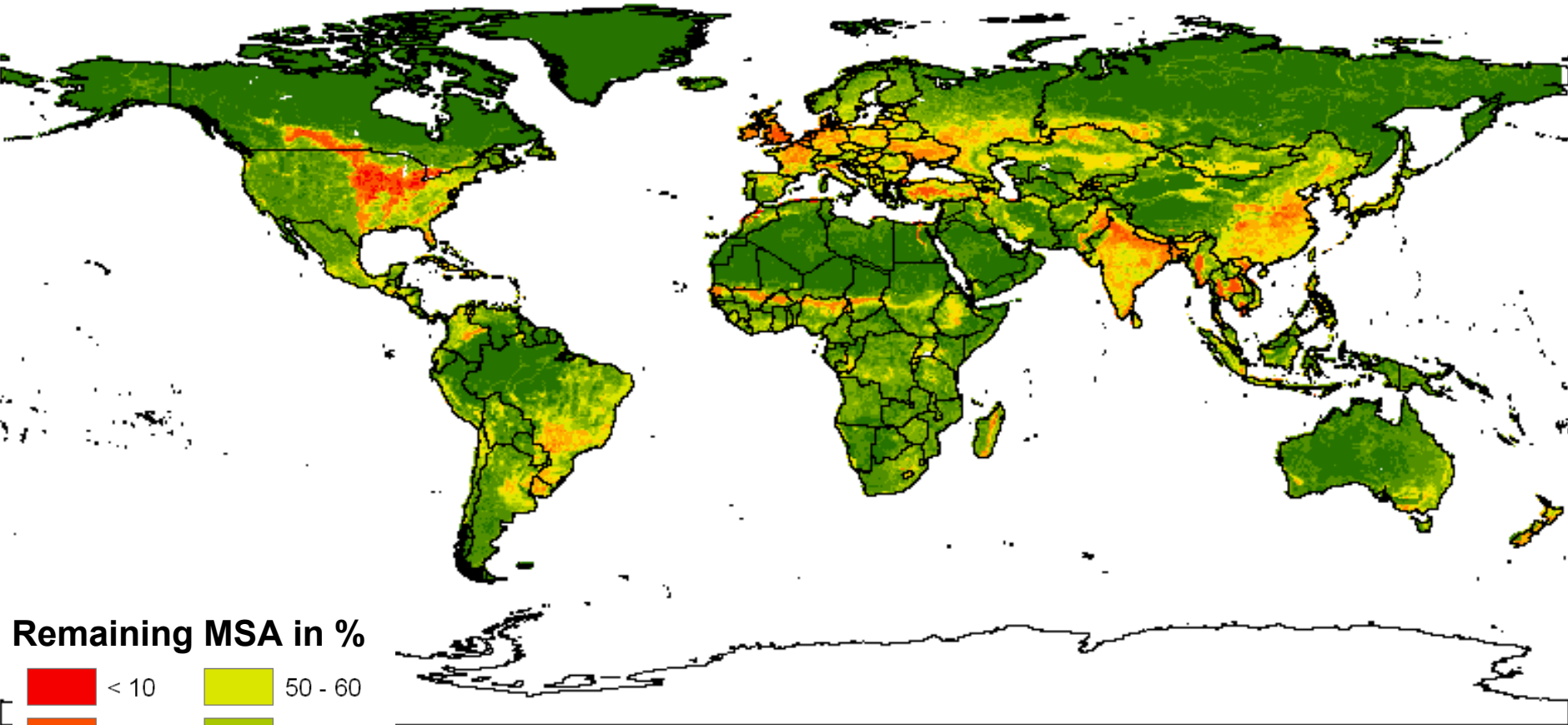




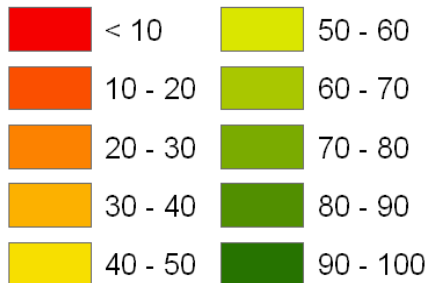
# Biodiversity, Ecosystems, and their Services



# Level of Biodiversity in the World in 2000 Using Mean Species Abundance (MSA) indicator

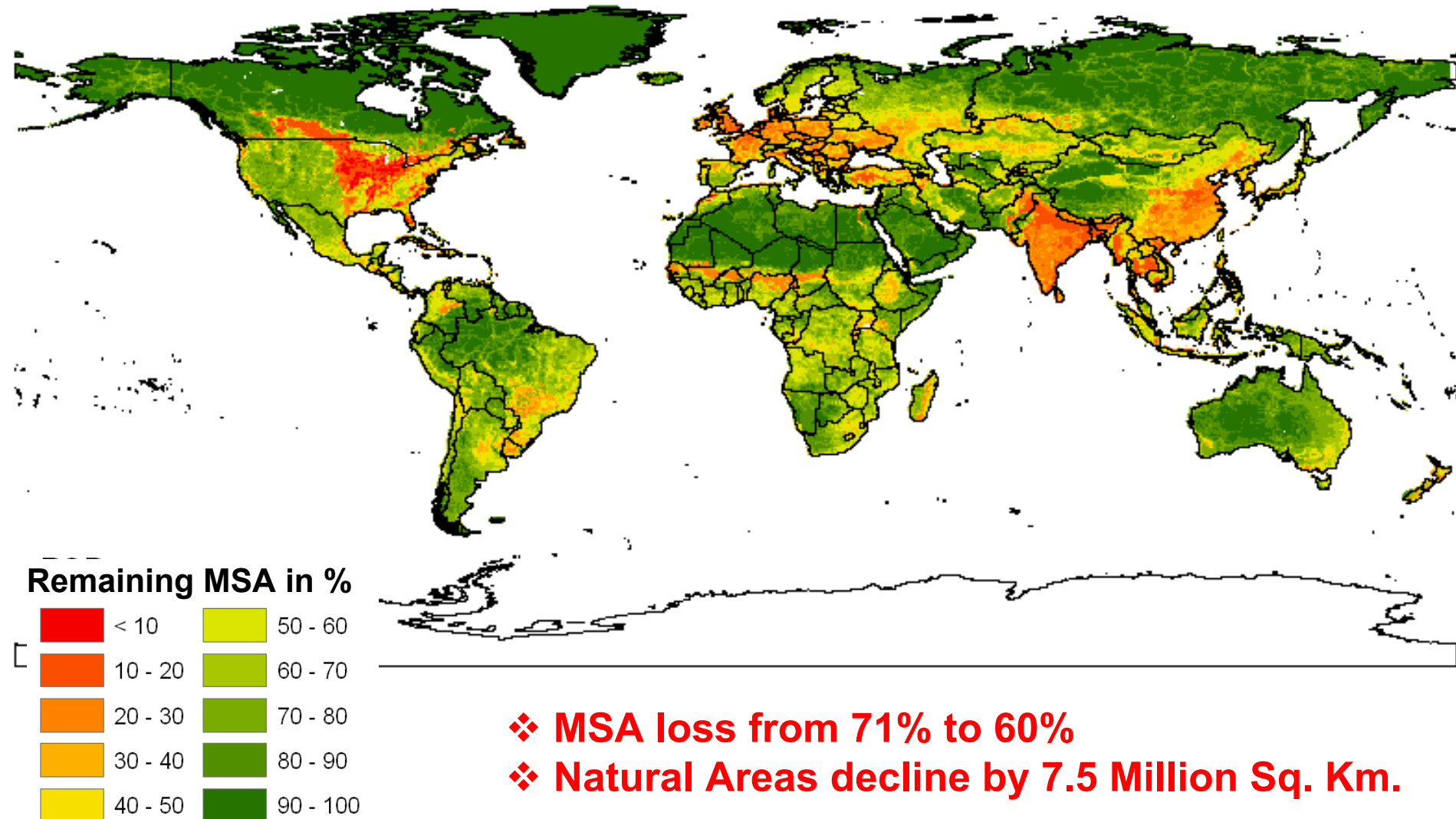


## Remaining MSA in %



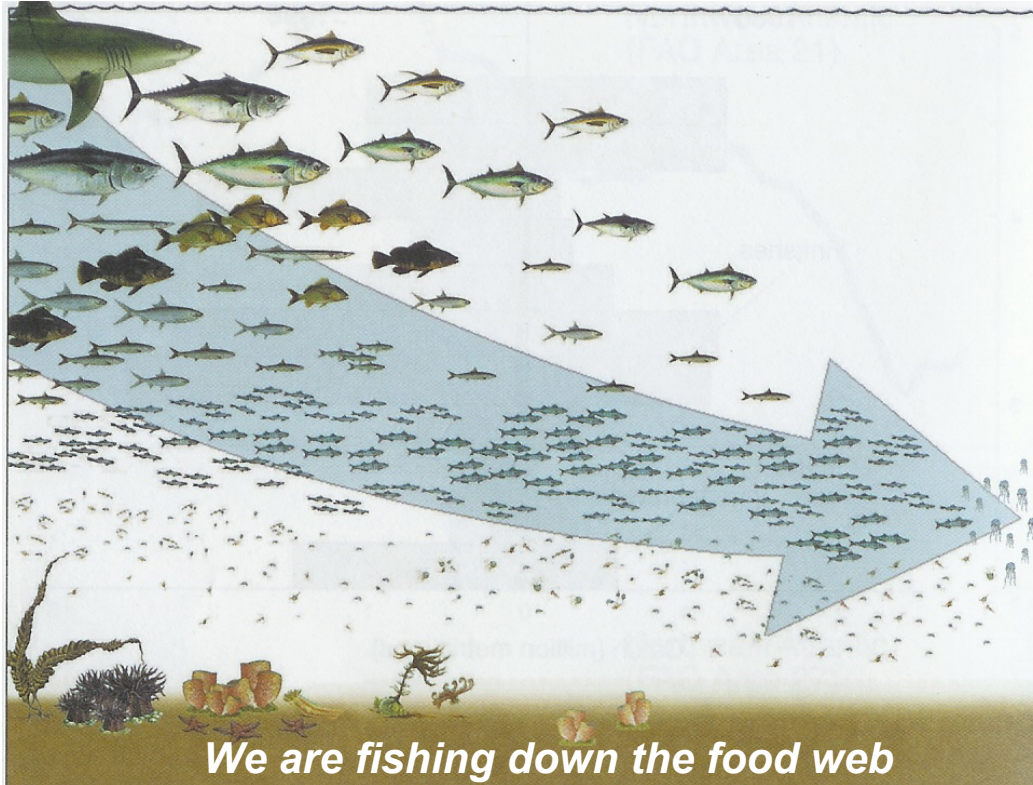
# Level of Biodiversity in the World in 2050

## One Scenario of the future : OECD/Globio





# The Loss of Fisheries



- Perverse Subsidies are a key driver of the loss of fisheries**
- Half of wild marine fisheries are fully exploited, with a further quarter already over-exploited**
- at risk : est. 27 million jobs***
- at risk : \$ 80-100 billion income from the sector***

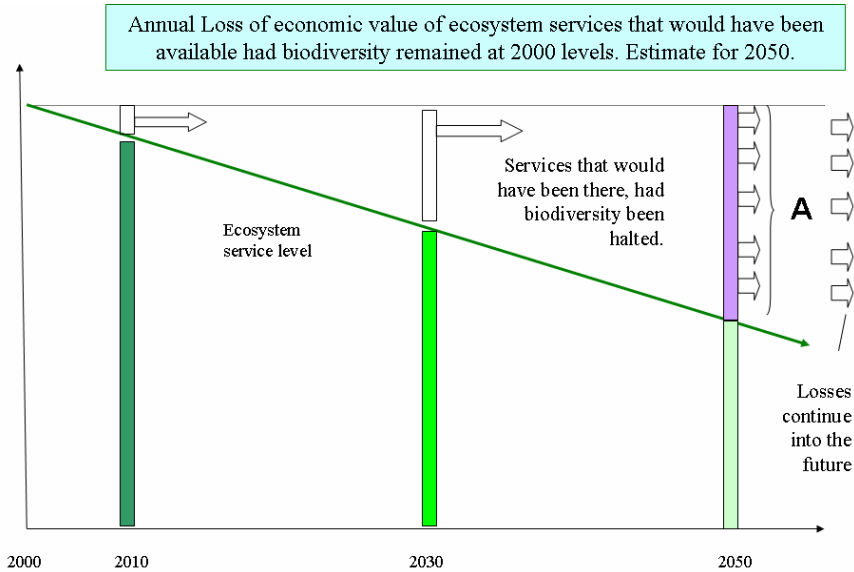
***More than a billion people rely on fisheries as their main or sole source of animal protein, especially in developing countries.***

*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*



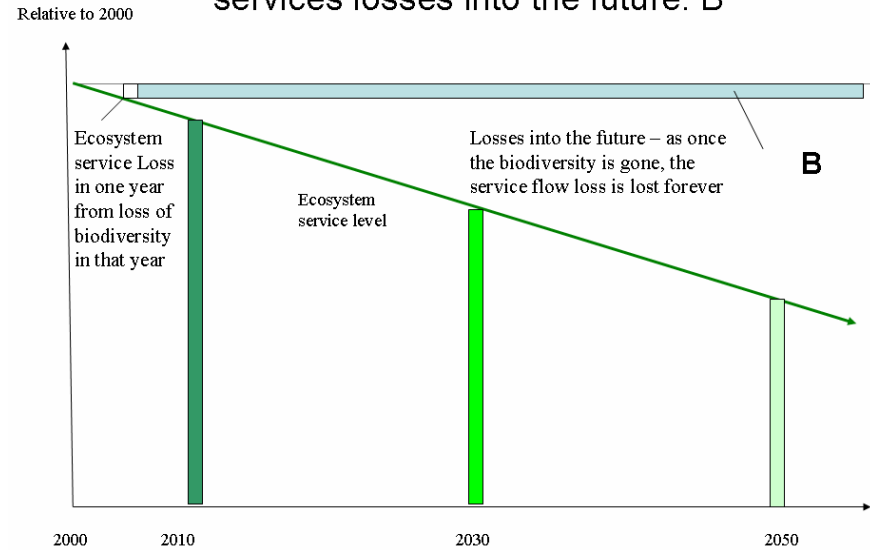
# Interim Results : Forest Biomes (COPI study, May 2008, TEEB)

## A : 50-year impact of inaction



## 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



**Lost Welfare equivalent to 6 % of GDP... or...**

**Natural Capital Lost from**  
**EUR  $1.35 \times 10^{12}$  to  $3.10 \times 10^{12}$**   
 (@ 4% Discount Rate) (@ 1% Discount Rate)



# Protected Areas - Conservation Values

- ❑ 11% of Land is legally 'Protected'
- ❑ Over 100,000 'Protected Areas'
- ❑ Significant Ecological and Societal benefits

*This is a well-researched field....*

**Protected Areas could produce benefits from goods and ecosystem services worth between US\$ 4,400 and 5,200 billion a year.** (Balmford et al. 2002: Economic Reasons for Conserving Wild Nature, in Science 297: 950-953.)



# How “Big” is Conservation ?

<b>Measures</b>	<b>Revenues (USD Bio)</b>	<b>Capital Employed (USD Bio)</b>	<b>People Employed</b>
<b>Sectors</b>			
<b>Automobiles<sup>4</sup></b>	<b>\$ 1,882 Bio</b>	<b>\$2,217 Bio</b>	<b>4.4 Mio</b>
<b>Steel<sup>4</sup></b>	<b>\$ 530 Bio</b>	<b>\$ 588 Bio</b>	<b>4.5 Mio</b>
<b>IT Services &amp; Software<sup>4</sup></b>	<b>\$ 942 Bio</b>	<b>\$ 179 Bio</b>	<b>5.7 Mio</b>
<b>Protected Area Conservation</b>	<b>\$ 5,000 Bio<sup>1</sup></b>	<b>\$ 125,000 Bio<sup>2</sup></b>	<b>1.5 Mio<sup>3</sup></b>

1. Balmford et al, 2002, “Economic Reasons for Conserving Wild Nature”, Science 297, estimates Protected Areas could produce goods and services valued at between \$ 4,400 billion - \$ 5,200 billion per annum
2. Natural Capital : Present Value (PV) of a constant service annuity of \$ 5,000 billion per annum, discounted @ 4% per annum
3. Estimate of the number employed directly in the maintenance, protection, and oversight of Protected Areas globally
4. Global Business Sector estimates from Global Markets Centre (“GMC”), Deutsche Bank



Question : “So why is there still a Problem ?  
Why continuing losses ?”



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Answer : “ Maybe... its not enough to  
*demonstrate* value



Question : “So why is there still a Problem ?  
Why continuing losses ?”

Answer : “ Maybe... its not enough to  
*demonstrate* value...

we also have to *capture* value..”



# Rewarding Unrecognized Benefits

- **Panama Canal** : Insurance firms and shipping companies are financing a 25-year project to reforest the water catchment of the canal to 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 (water storage, biodiversity maintenance, rainfall regulation, etc) will gain value. Revenues will be shared 80% with the local community.

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



# Sharing the Benefits of Conservation

## An example from Uganda

“Revenue Sharing Programme” of Ugandan Wildlife Authority (UWA) disburses 20% of all revenues from Protected Area (PA) tourism to the local communities neighbouring PA’s.... A “win-win” solution

### Population Trends of Selected Species in Lake Mburo National Park

Species	1999	2002	2003	2004	2006
Zebra	2,249	2,665	2,345	4,280	5,968
Buffalo	486	132	1,259	946	1,115
Waterbuck	598	396	899	548	1,072
Hippo	303	97	272	213	357
Impala	1,595	2,956	2,374	3,300	4,705

(Source : UWA )



# New Markets which reward biodiversity & ecosystem conservation...

**Wetland Banking** : USA - companies or individuals buy environmental credits from Wetland Mitigation Banks to pay for degradation of wetland ecosystems due to agriculture or development. Over 400 banks established, majority by private entities. Market 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 threatened species and habitats.

**Bio-Banking** : Australia, 2006, a pilot project in New South Wales to create 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.



“Development Projects have a tangible present value.

But what is a stream of ecosystem and biodiversity benefits worth today ?”



# Three Hidden Stories of “Discounting”

- Declining Growth Paths ...
- Marginal Utility of \$1 to the Rich vs Poor ....
- Inter-generational Equity...

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



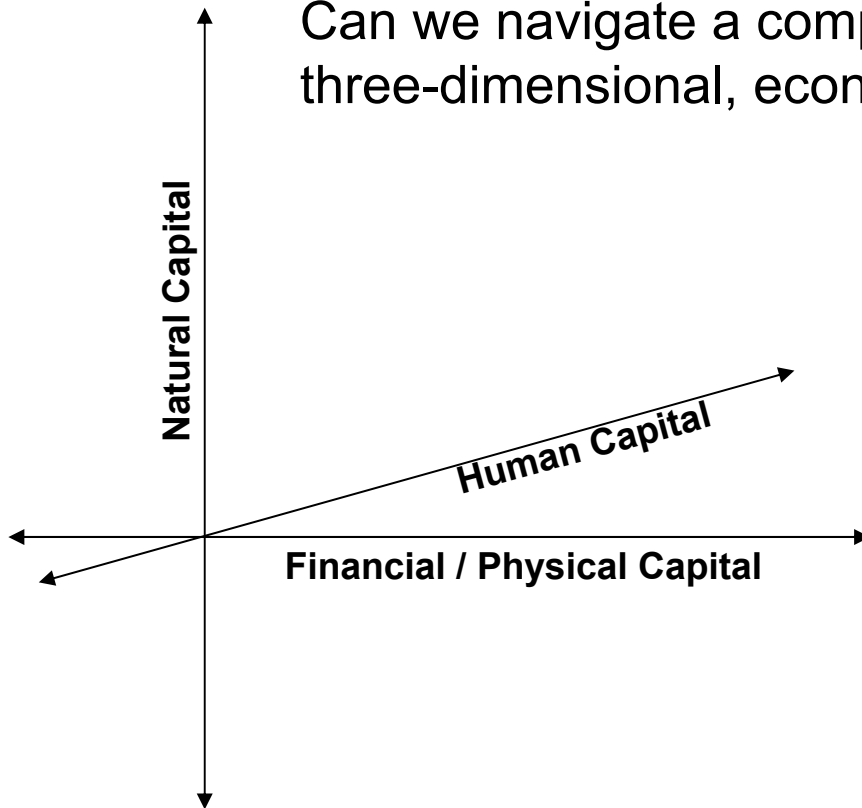
We want to demonstrate value and capture value....  
becoming responsible managers of

Can we manage what we do not measure ?



# Navigation Challenge Ahead

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



... with a simple economic compass ?



# Measuring what we Manage

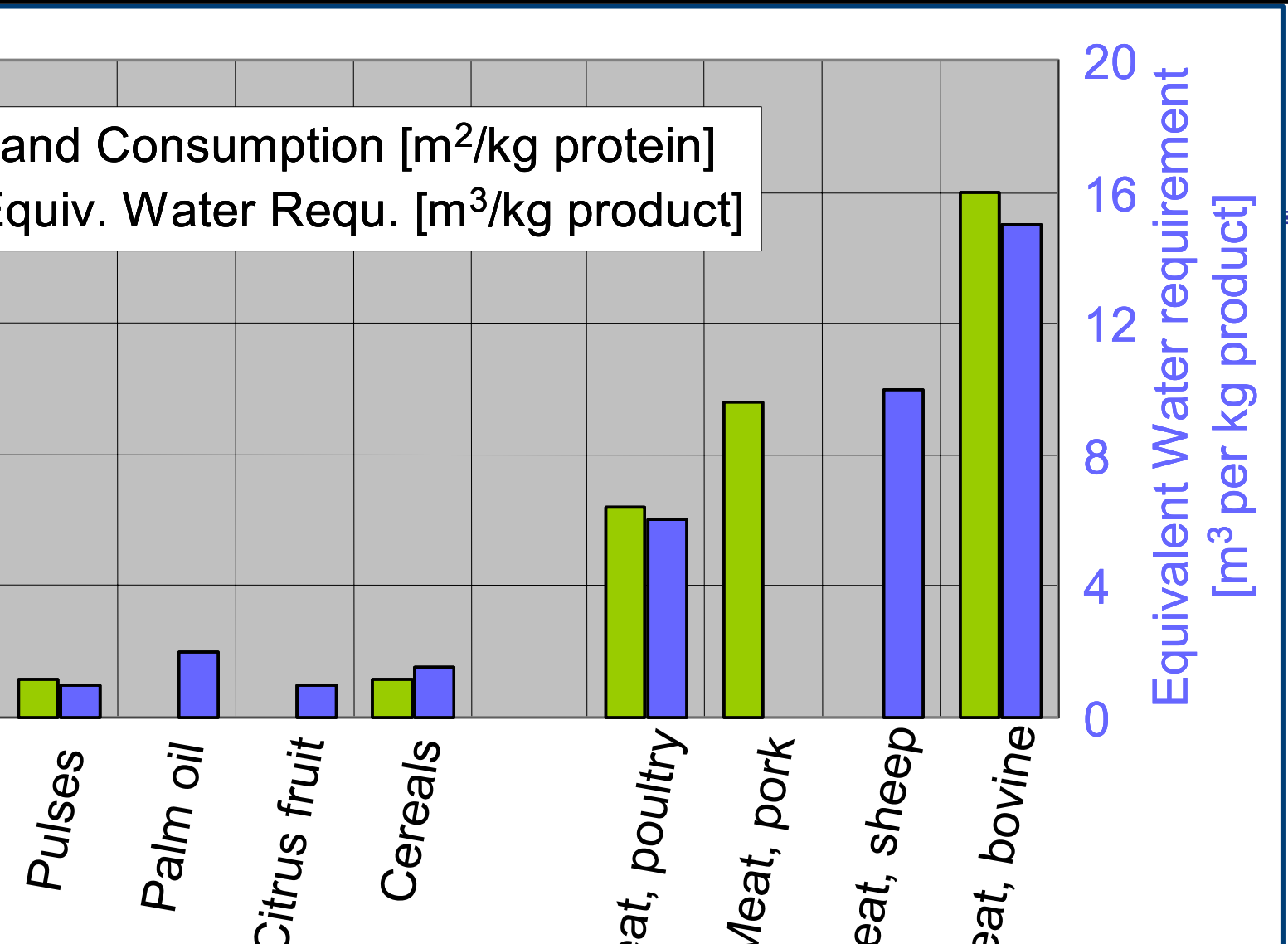
*“Because National Accounts are based on financial transactions, they account nothing for Nature, to which we don’t owe anything in terms of payments but to which we owe everything in terms of livelihood.”*

Bertrand de Jouvenel 1968.

Courtesy of European Parliament



**“Beyond GDP”**  
November, 2007, Brussels

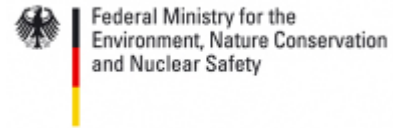




Federal Ministry for the  
Environment, Nature Conservation  
and Nuclear Safety



# A Personal Note ..



, Atherton Tablelands, North Queensland, Australia..





Small Tree-frog  
with old  
green tree



# TEEB – Interim Report



Federal Ministry for the  
Environment, Nature Conservation  
and Nuclear Safety



# Replacement Required

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Federal Ministry for the  
Environment, Nature Conservation  
and Nuclear Safety



KfW Public Meeting  
Convention for Biological Diversity  
Bonn, 29<sup>th</sup> May 2008

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Federal Ministry for the  
Environment, Nature Conservation  
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**Thank You !**