Biodiversity, Economics and Poverty

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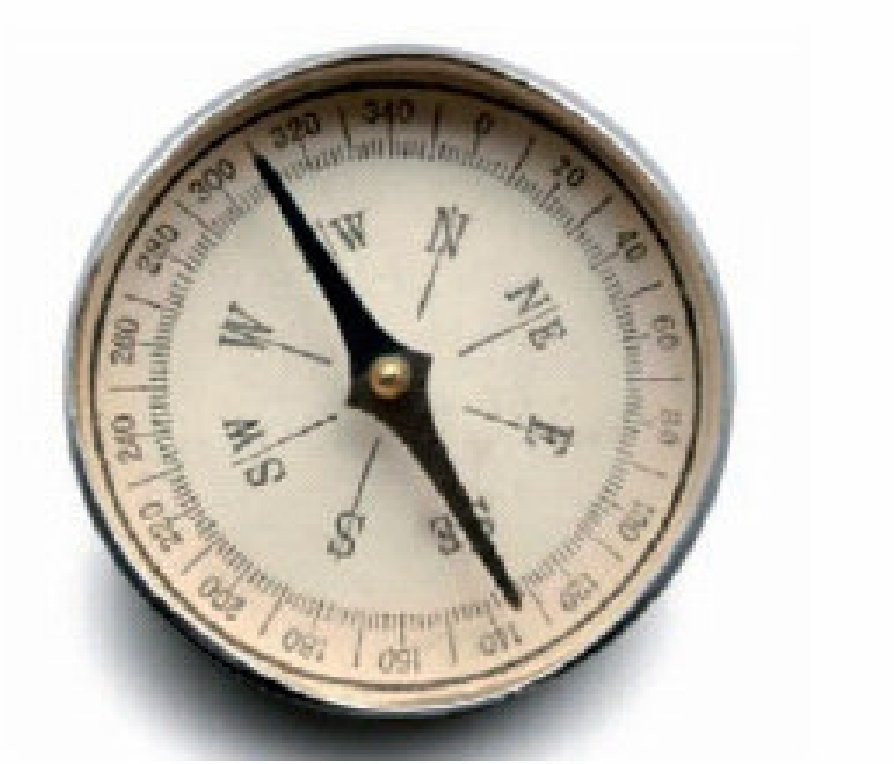
The Economics of Ecosystems and Biodiversity (TEEB)

TEEB – Interim Report

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

Replacement Required

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety



Reversing Biodiversity Loss : From Costs to Benefits

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

A personal note…

Tarzali, Atherton Tablelands, North Queensland, Australia

Complex Mesophyll Vine Forest (CMVF-1(b))…. Day 0

TREAT Volunteers who planted it….


Eastern Dwarf Tree-frog
on a 9-month old
Lemon Aspen tree
Complex Mesophyll Vine Forest …. Month 9….

TEEB Studies & Interim Report for COP-9

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

- Synthesis of Evidence (Synthesis of submitted evidence : over 100 papers from the 'call for evidence', Markandya et al, FEEM)
- Scoping Science Study ("Review of the Economics of Biodiversit loss : Scoping the Science", A. Balmford et al, Cambridge)
- COPI Report ("The Cost of Policy Inaction : The case of not meeting the 2010 biodiversity target" – Alterra & IEEP, Braat et al)
- Forest Biodiversity Valuation ("Study on the Economics of Conserving Forest Biodiversity" – Cambridge, Kontoleon et al)
- European Wetlands Study ("Ecosystem Accounting for the Cost of Biodiversity Losses : Framework and Case Study for Coastal Mediterranean Wetlands" – EEA, Weber et al)
- COP-9 Report ("Interim Report : The Economics of Ecosystems & Biodiversity", Sukhdev et al)

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The themes of Poverty and Equity pervade all areas of our work so far …

- Ecology
- Human Welfare
- Valuation
- Discounting
- Policy Impacts

- **Ecology**
- Human Welfare
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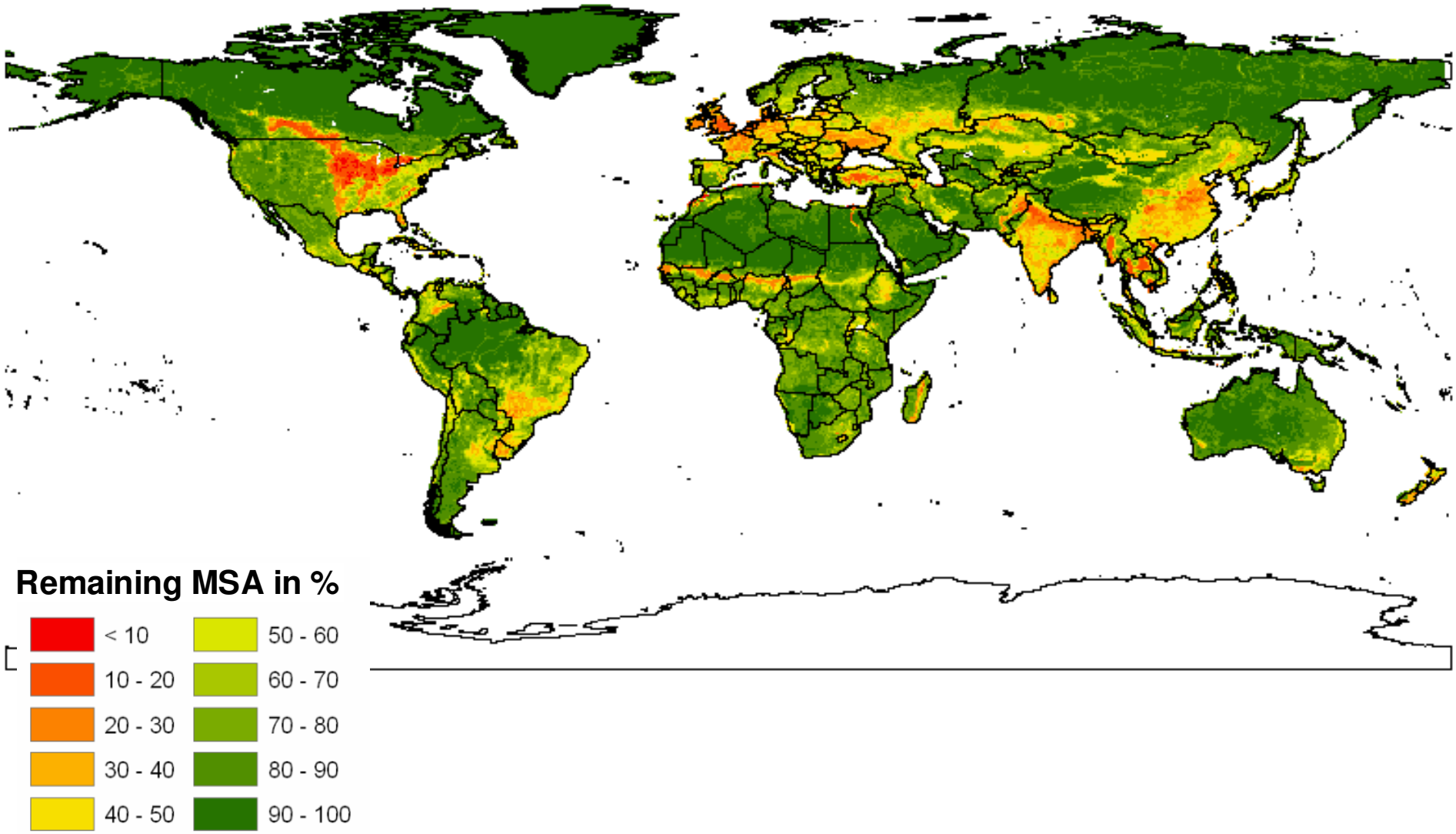
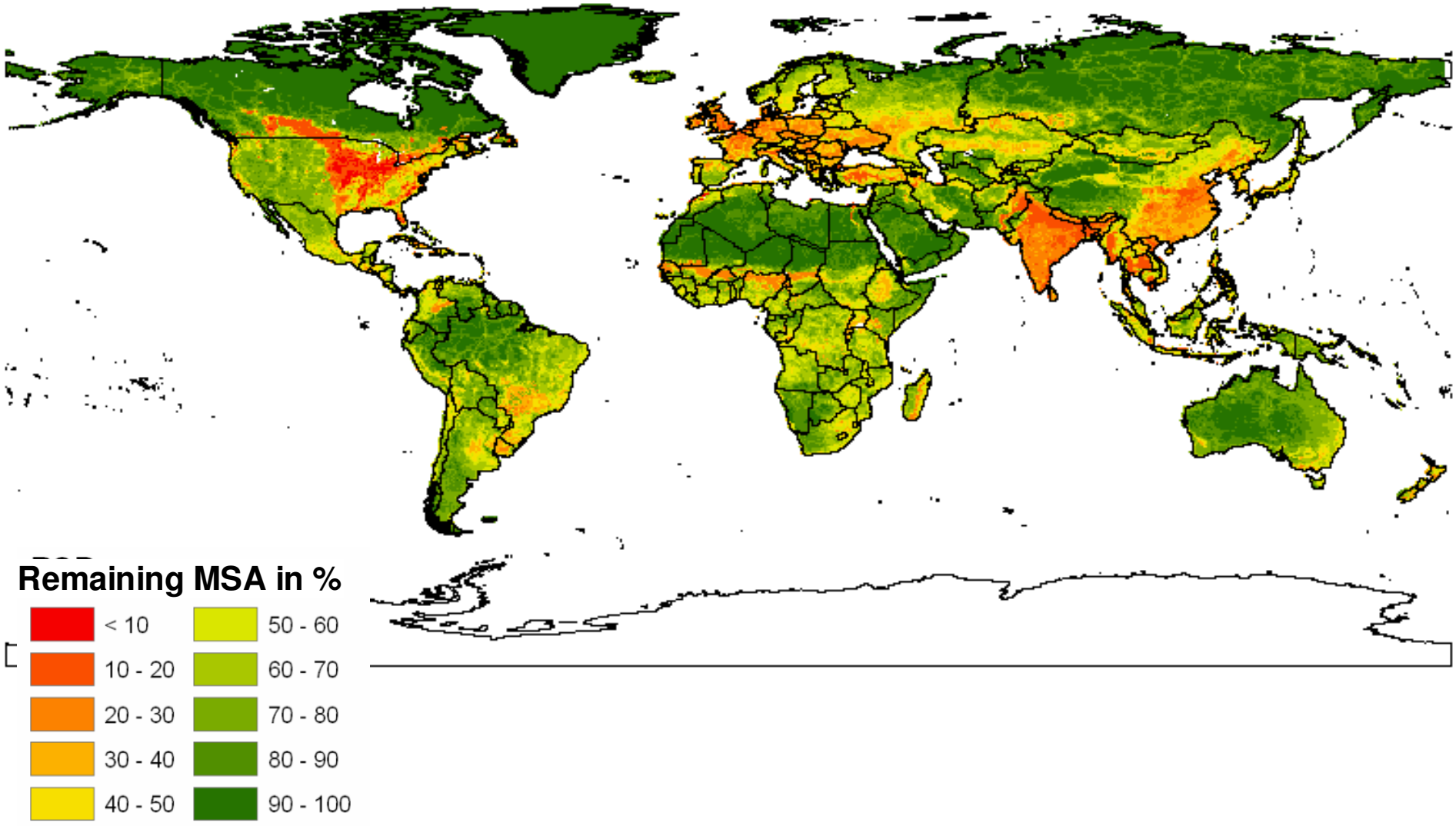
Level of Biodiversity in the World in 2000
Using Mean Species Abundance (MSA) indicator



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

Level of Biodiversity in the World in 2050
One Scenario of the future : OECD/Globio



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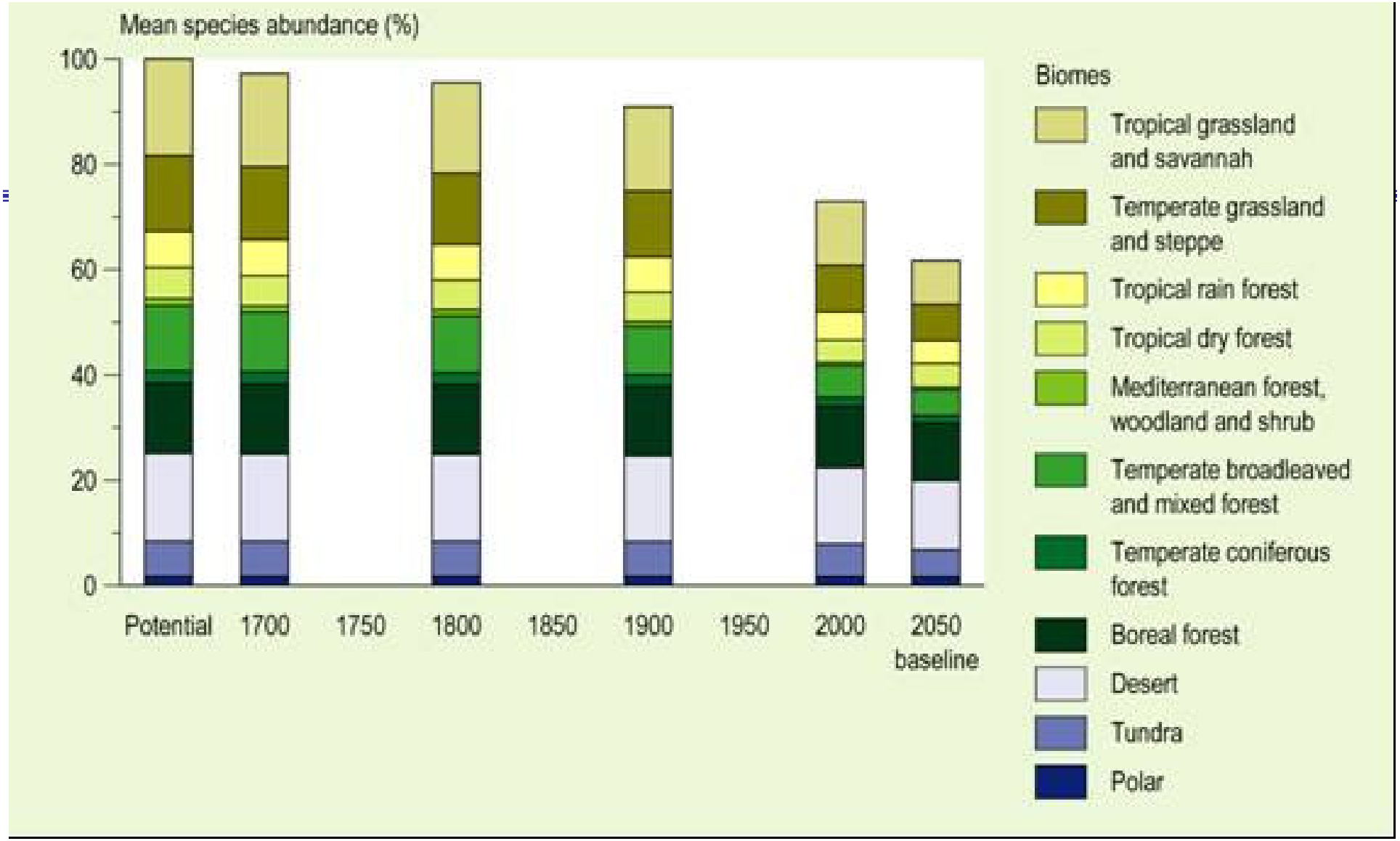
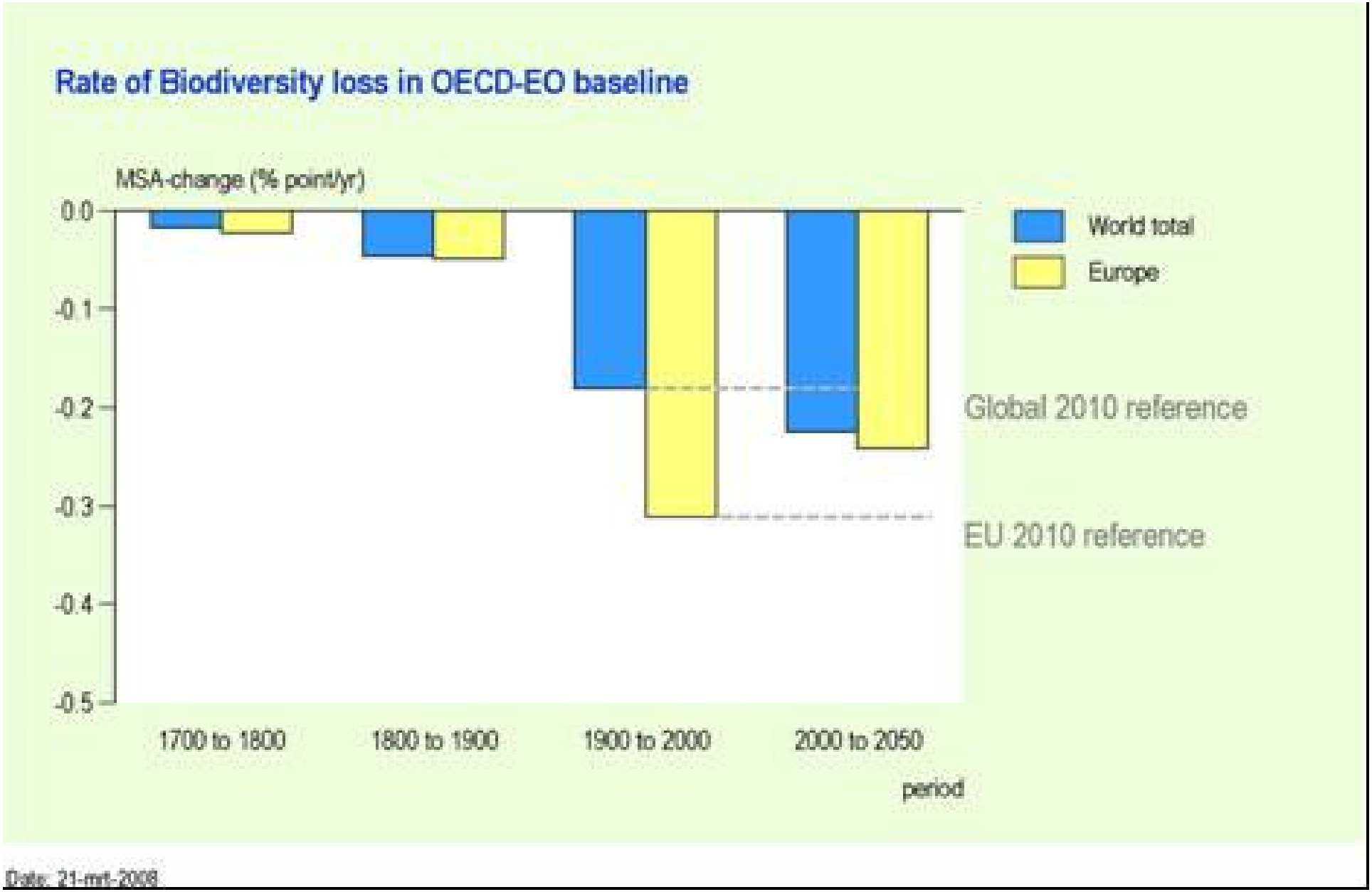


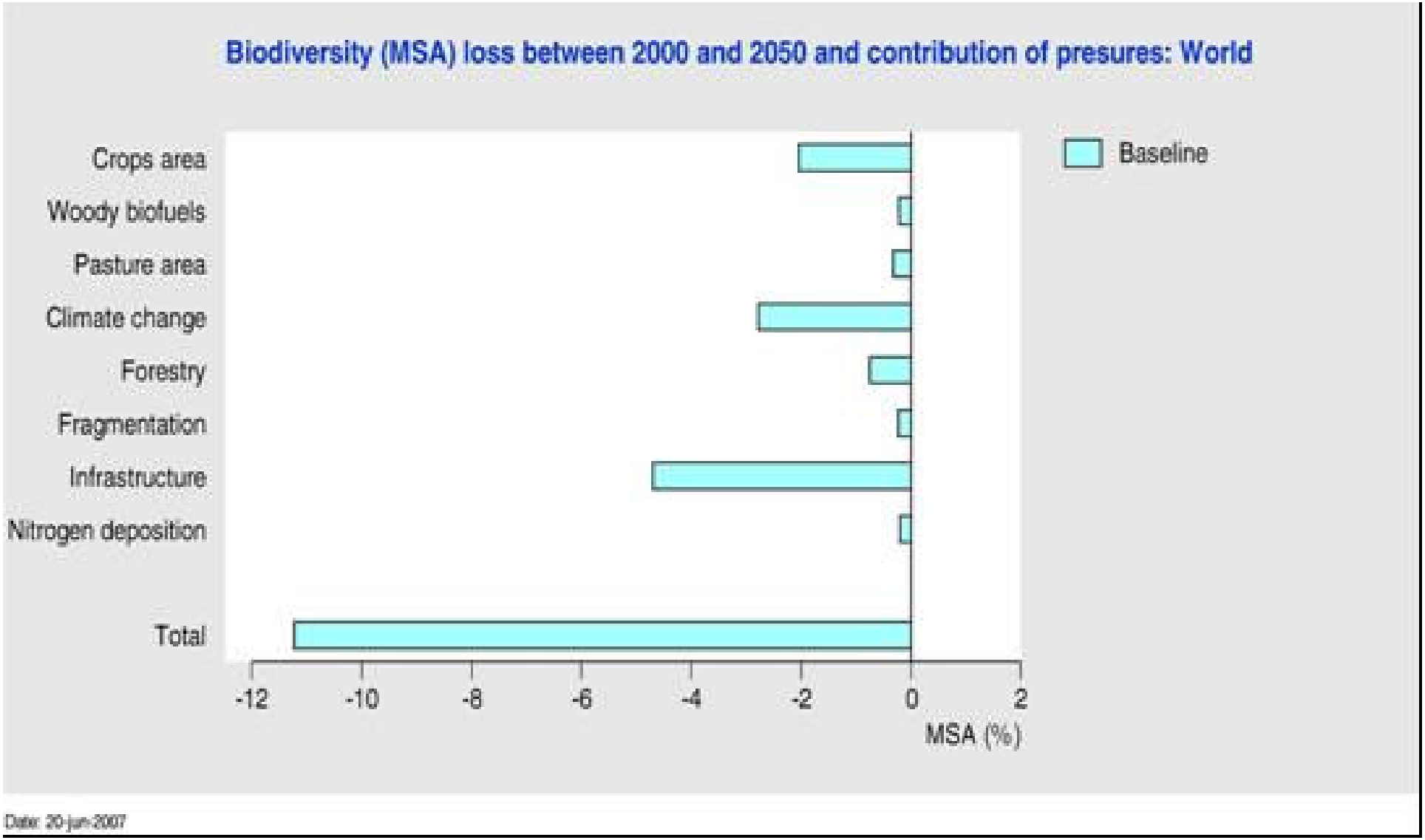
Global terrestrial biodiversity development by major biomes, from 1700 to 2050

COPI : MSA statistics indicate that in the "Policy Inaction" scenario :-

- **Global objective (significant reduction in rate of loss) unlikely by 2050**
- **Stricter European goal (halting further loss) unlikely by 2050**



(COPI, Fig 4.2) Rate of yearly terrestrial biodiversity loss (MSA %-points) for different periods. Mean Species Abundance (MSA) 2000 and Predictions 2050



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

Main drivers of 11+% Biodiversity Loss over the 50 years to 2050

The Loss of Fisheries

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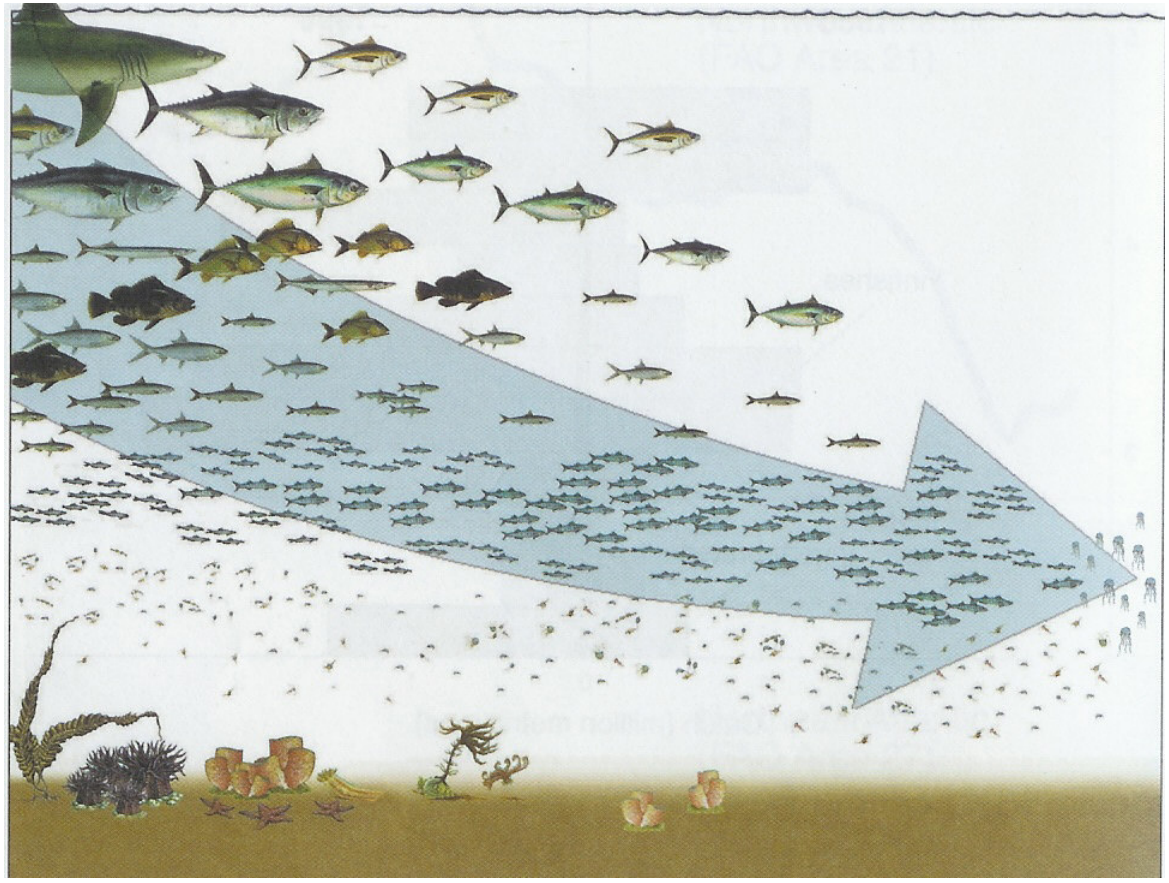
More than a billion people rely on fisheries as their main or sole source of animal protein, especially in developing countries.



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

We are fishing down the food web to ever smaller species…

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***

- Ecology
- **Human Welfare**
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From Ecosystem Services to Poverty Alleviation

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TEEB "Interim Report" spells out direct links between Biodiversity loss & Ecosystem degradation and the risks Of failure on ALL EIGHT Millenium Development Goals

Ecosystem Service	**Related MDG**	**Links with Target**	**Risks and Conflicts**	**Evaluation**

Haiti : Ecosystem Losses and Links to MDG's 1, 4, 5, 8…

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- Haiti was originally fully forested, less than 3% cover still remains

- Poorest country in the Western Hemisphere 65% of its people must survive on less than 1 $ a day.

- 1950-1990, the amount of *arable land* almost halved due to soil erosion.

- Deforestation has diminished evaporation back to the atmosphere over Haiti, and 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 initially 9,500 acres it planned 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

MDG 3 : Example from India

MDG 3:
Promote gender equality and empower women

Box 2.3: Gender, poverty and biodiversity in Orissa, India

The impact of the loss of biodiversity, often not very visible, has serious implications for poverty reduction and well-being for women as it severely affects the role of women as forest gatherers. Studies in the tribal regions of Orissa and Chattisgarh, states in India which were once heavily forested, have recorded how deforestation has resulted in loss of livelihoods, in women having to walk four times the distance to collect forest produce and in their inability to access medicinal herbs which have been depleted. This loss reduces income, increases drudgery and affects physical health. There is also evidence to show that the relative status of women within the family is higher in well-forested villages, where their contribution to the household income is greater than in villages that lack natural resources.

Sarojini Thakur, Head of Gender Section, Commonwealth Secretariat, personal communication, May 15th 2008.

"GDP of the Poor"

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Gross domestic product in India (2003) **(INR millions)**	24,695,640 (617,391$)
Contribution of agriculture, forestry, livestock and fishing **(INR millions)**	5,054,988 (126,374$)
Of which contribution by the poor (per hectare value multiplied with area of small holdings / less than 1 ha) **(INR millions)**	1,140,987
Percentage contribution of agriculture, forestry and fishing to GDP	20.5
Population dependent on agriculture, forestry and fishing in India Of which poor (60% of people dependent on agriculture have less than 1 ha holdings)	543 (478)
Per capita agricultural GDP of the poor	2,387 (60$)
Per capita GDP for the rest of the population (less GDP of the poor and rest of the population 700 million)	33,649 (841$)
Adjustments for Unrecorded timber and fuel wood from forestry GDP **(INR millions)**	154,521 (3,863$)
Adjustments for contribution of ntfps to the economy **(INR millions)**	41,890 (1,047$)
Adjustments for ecotourism and biodiversity values **(INR millions)**	242,953 (6,073$)
Adjustments for other ecological services **(INR millions)**	225,504 (5,638 $)
Adjusted contribution of agriculture, forestry and fishing to GDP **(INR millions)**	1,805,855 (7.3% of GDP)
Per capita adjusted agricultural GDP for the dependent population (in INR)	3,778 (94$)
Per capita adjusted GDP for the entire population (in INR)	24,093 (602$)
Equity adjusted cost per person for agriculture dependent community (in INR)	5,038 (126$)

- **India - Example**
- **540 Million engaged in farming, animal husbandry, informal forestry, fisheries**
- **ESS add "only 7.3%" to classical GDP, *or***
- **ESS add 57 % to "GDP of the Poor"**
- **Replacement of those ESS would be beyond the capacity of the poor**

In Summary…

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Our observations from "Phase I" work are that

- the consequences of biodiversity loss and ecosystem service degradation are *not* being shared equitably across the world
- the areas of richest biodiversity and ecosystem services are in developing countries where they are relied upon by billions of people to meet their basic needs of nourishment and livelihood
- subsistence farmers, fishermen, pastoralists, the rural poor and traditional societies face the most serious risks from ecosystem degradation and biodiversity loss
- 'Green GDP', 'Inclusive Wealth' and other adjustments to national accounting need to be *sectorally focussed* in order to deliver policy-relevant messages

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The link between biodiversity, ecosystems, their services, and benefits to mankind…

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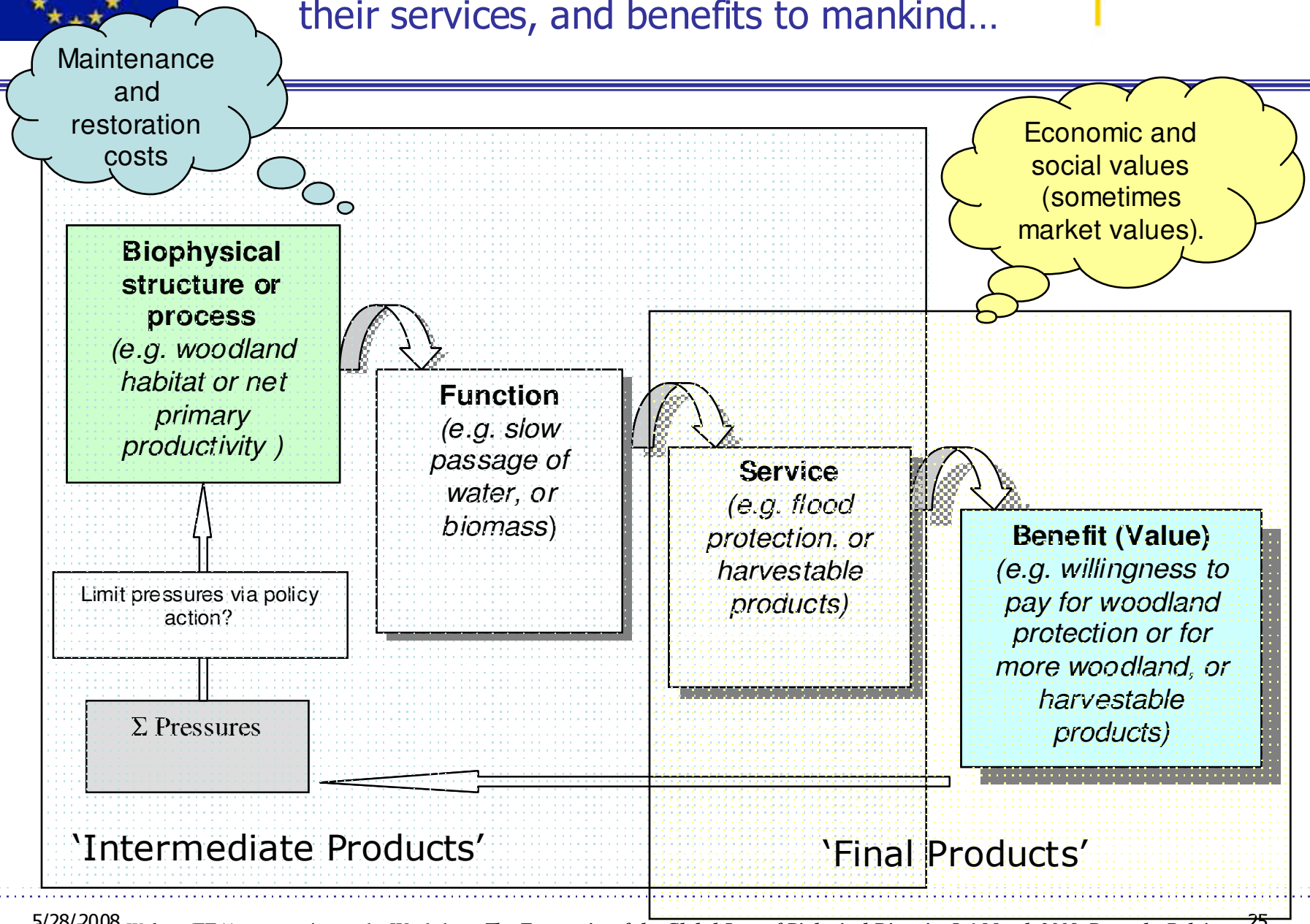
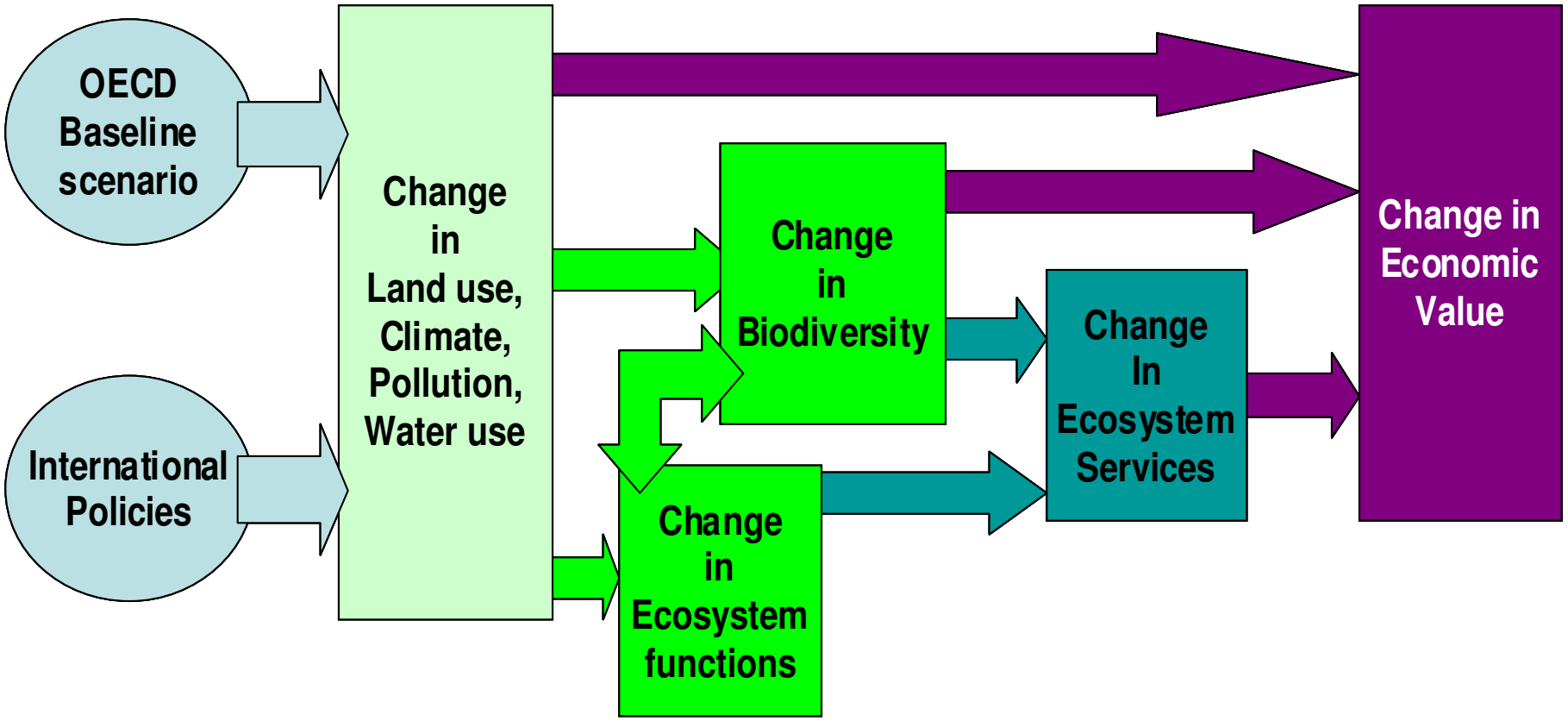


Source: Jean-Louis Weber (EEA) presentation at the Workshop: ***The Economics of the Global Loss of Biological Diversity 5-6 March 2008, Brussels, Belgium***

Biodiversity, Ecosystems, and their Services

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety



Ecosystem services, land use and well-being

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Services / Land cover types	1.1 Food	1.2 Materials	1.3 Forest trees-related	1.4 Plant-related	1.5 Physical support	2.1 Amenity	2.2 Identity	2.3 Didactic	3.1 Cycling	3.2 Sink	3.3 Prevention	3.4 Refugium	3.5 Breeding
Artificial surfaces/ Urban													
Arable land & permanent crops													
Grassland & mixed farmland													
Forests & woodland shrub													
Heathland, sclerophylous veg.													
Open space with little/ no vegetation													
Wetlands													
Water bodies													

Source: Hans-Dieter Weber (EEA) presentation at the Workshop: *The Economics of the Global Loss of Biological Diversity 5-6 March 2008, Brussels, Belgium*

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"Development Projects have a tangible present value.

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

Three Hidden Stories of "Discounting"

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- **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

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"Capturing Conservation Values "

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.)

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

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Answer : “ Maybe… its not enough to
demonstrate value

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Why continuing losses ?”

Answer : “ Maybe… its not enough to
demonstrate value…

you also have to *capture* value..”

Sharing the Benefits of Conservation
An example from Uganda

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Some Protected Areas placed under the "Revenue Sharing Programme" of the Ugandan Wildlife Authority, and a case study
Bwindi Impenetrable National Park
Mgahinga Gorilla National Park
Lake Mburo National Park
Queen Elizabeth National Park
Rwenzori Mountains National Park
Kibaale National Park
Semliki National Park
Murchison Falls National Park
Mount Elgon National Park

Sharing the Benefits of Conservation
An example from Uganda (cont'd)

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"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.

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)

Thank You !