

The Economics of Ecosystems & Biodiversity



**30th Nov 2009
Jakarta**



TEEB Biodiversity Challenges in a time of Economic Recovery

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World Economic Forum "Global Agenda"



Federal Ministry for the
Environment, Nature Conservation
and Nuclear Safety

- Leading Economic Forum
- Annual Meeting at Davos, Switzerland
- "Who's-who" of Business Leaders & Politicians



- Second Annual Summit of "Global Agenda Councils"
- ... at Dubai (!!) 20th-22nd November 2009
- 78 Councils



Global Agenda Councils of the WEF....



Values Frame	Global Risks	Welfare (E+S)	Security	Institutions	Sustainability	Business	Regions	Advisory
Gender	Nutrition	Philanthropy	Cooperation	Government	Ecosystem/ Biodiv Loss	Mining	Africa	
Next Gen Health	Chronic Diseases	Int Monetary System	Conflict Resolution	Institutional Governance	Sust. Consump.	Construction	Middle East	Social Enterprise
Values	Pandemics	LT Investing	Internet	Legal System	Healthcare	Real Estate	E. U.	
Children's Welfare	Food Security	Systemic Fin Risk	Fragile States	Decision-making	Population	Urban Mngmt	Latin America	Strategic Foresight
Education	Water	Investment	Terrorism	Design	Transport	Marketing	Australia	
Journalism	Energy	Trade	Human Rights	Intellectual Property	Ageing Society	Entertainment	China	Economic Developm't
Faith	Illicit Trade	Corruption	Assistance	Measuring Progress	Climate Change	Skills Gaps	Japan	New Multi-nationals
	Catastrophe	Migration			Energy	Diversity	Korea	
	Emerging Technology	Employment Support			Ocean Governance	Innovation	Russia	
		Financial Inclusion				Mobile Comms	India	
						Sports	Pakistan	



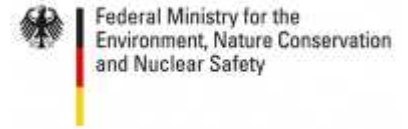
Global Agenda Councils of the WEF....



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WEF - GAC Recommendations



- 1. Ensure inclusion of REDD+ and ecosystem-based adaptation in the climate agreement at Copenhagen and in international carbon markets**
- 2. Set up a “Quick-Start Fund” to seed post-Copenhagen investments in REDD+ capacity building , ecosystem-based adaptation measures, and renewable energy start-ups**
- 3. Ask for “Net Positive Impact on Ecosystems and Biodiversity” to be tabled as the basis of a global agreement at CBD COP-10**

Key to Success : Widespread adoption by other Global Agendas as a solution to THEIR Problems



In A Word....



"Mainstreaming"



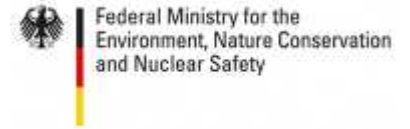
Objective of TEEB Phase II....



"Mainstreaming"



TEEB – Final Reports Nov 2009 – August 2010



- ➔ Science & Economics Foundations, Policy Costs, & Costs of Inaction
- ➔ Policy Evaluation for Policy-Makers
- ➔ Decision Support for Administrators
- ➔ Business Risks & Opportunities
- ➔ Citizen & Consumer Ownership



TEEB Outreach "Mainstreaming"

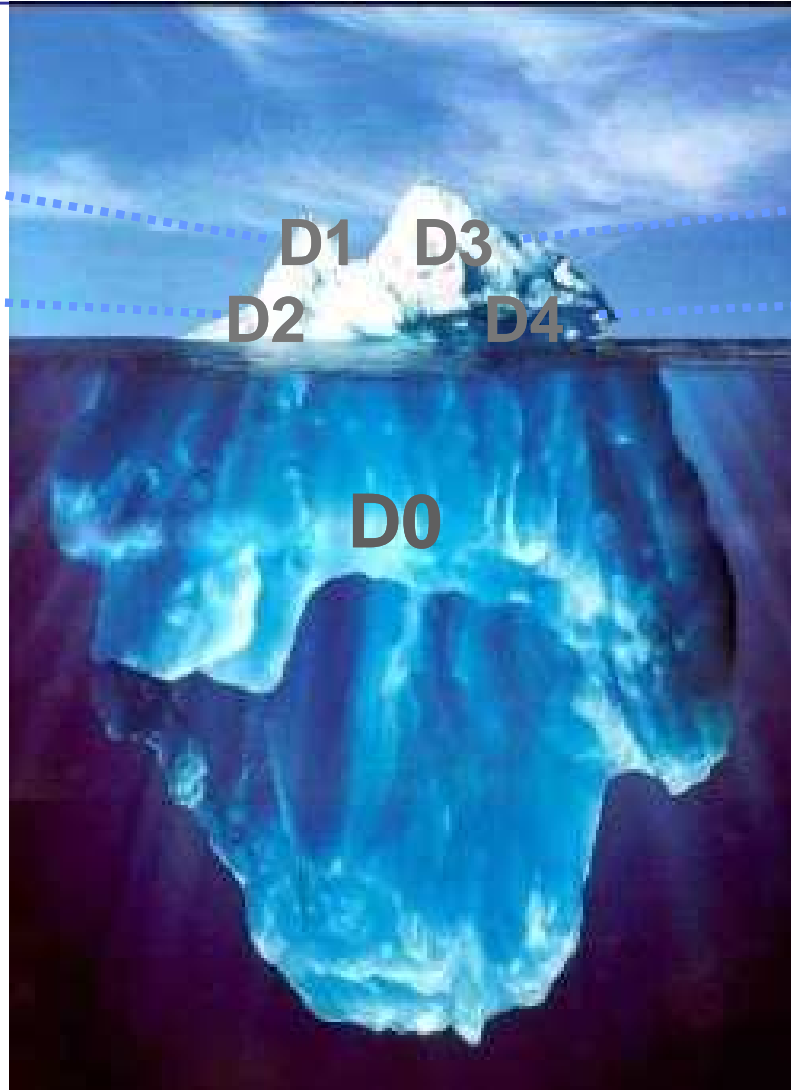


Policy-Makers..

Administrators..

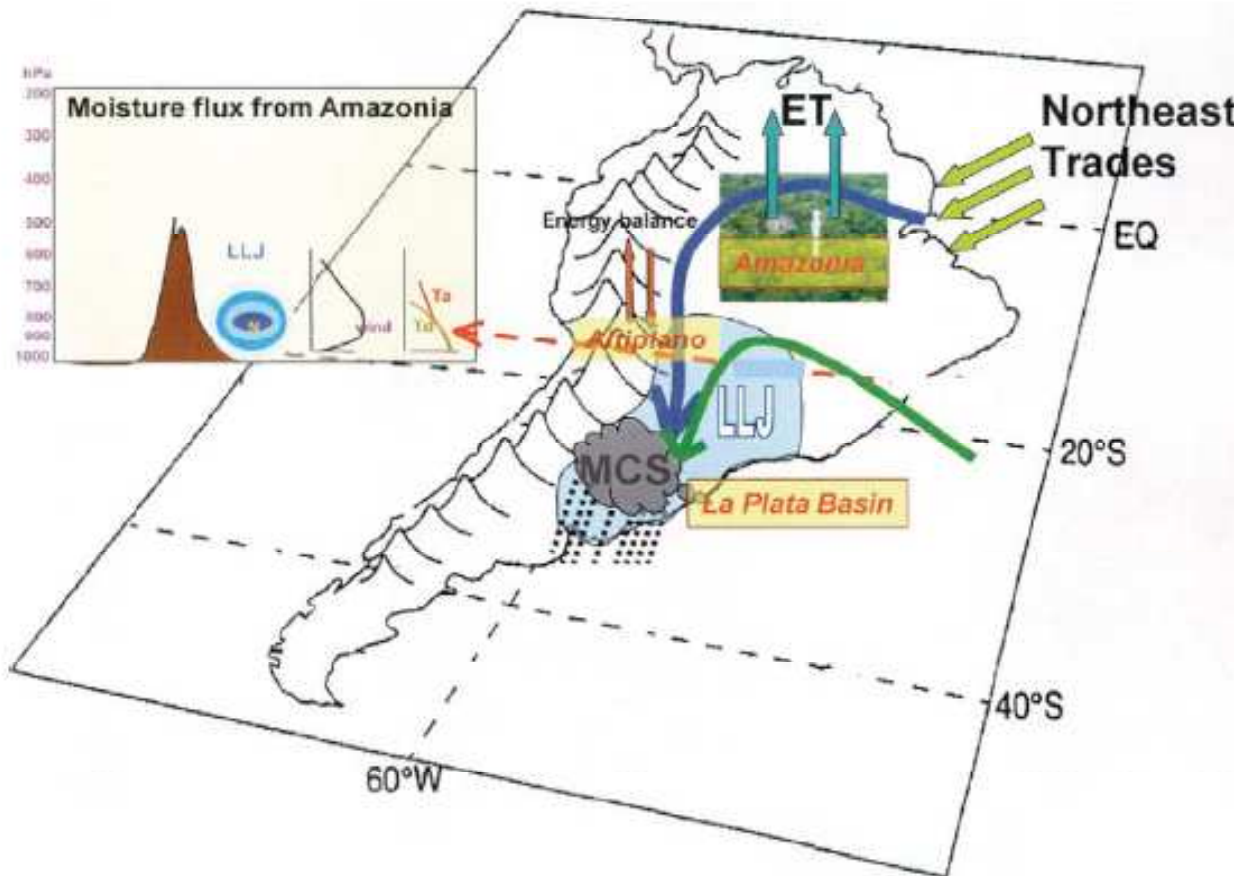
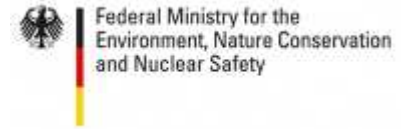
Businesses..

Citizens..





From where does the Granary of Latin America get its Freshwater ?



Amazon Rainforest “Water Pump”

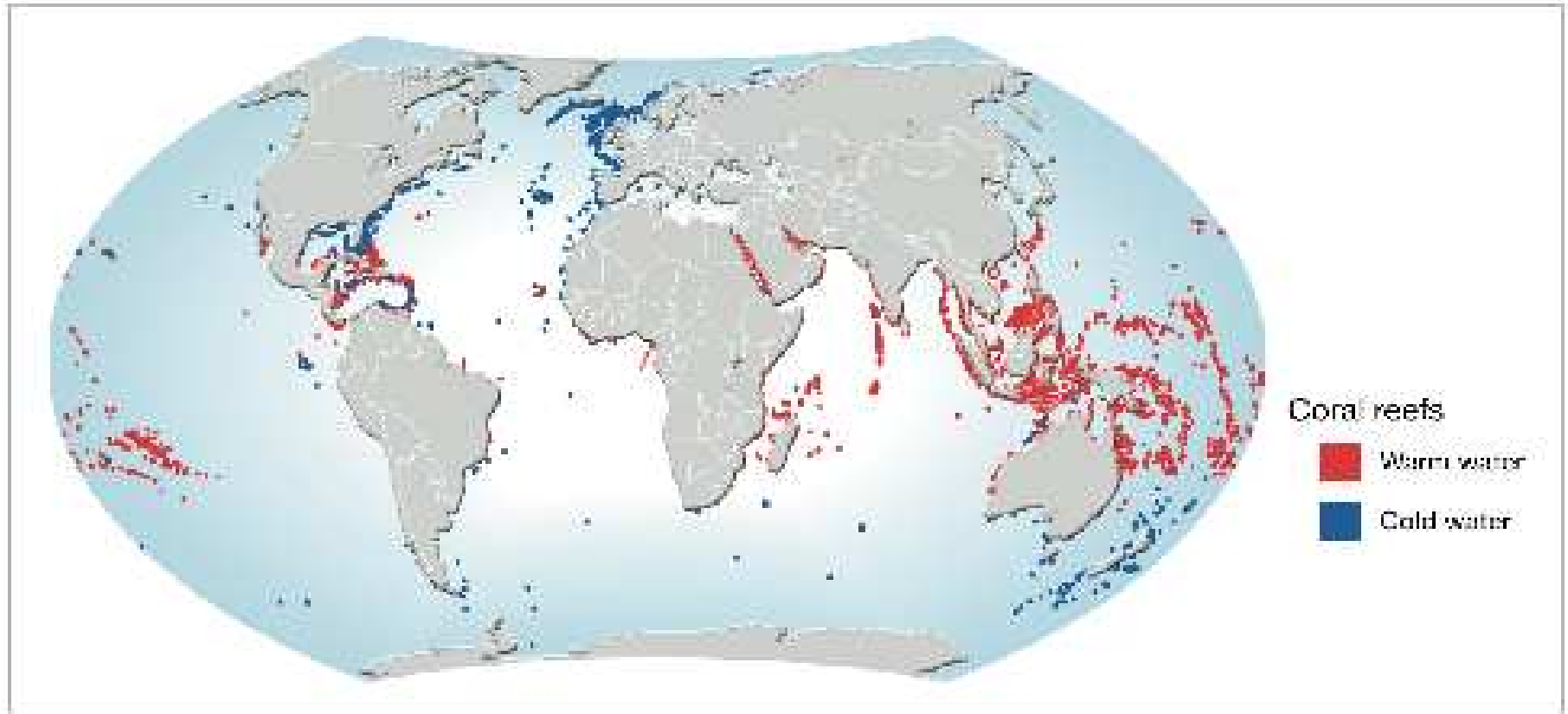
Evapo-transpiration puts 20 billion tonnes of water into the atmosphere daily, some of which falls as rain in the Rio Plata Basin...

(Global Canopy Programme & Canopy Capital Ltd, 2008)

Marengo et al. 2004, Journal of Climate



Tropical Coral Reefs...



500 Million people depend on Tropical Coral Reefs for food and livelihood



WHAT WE THINK CORAL REEFS LOOK LIKE....



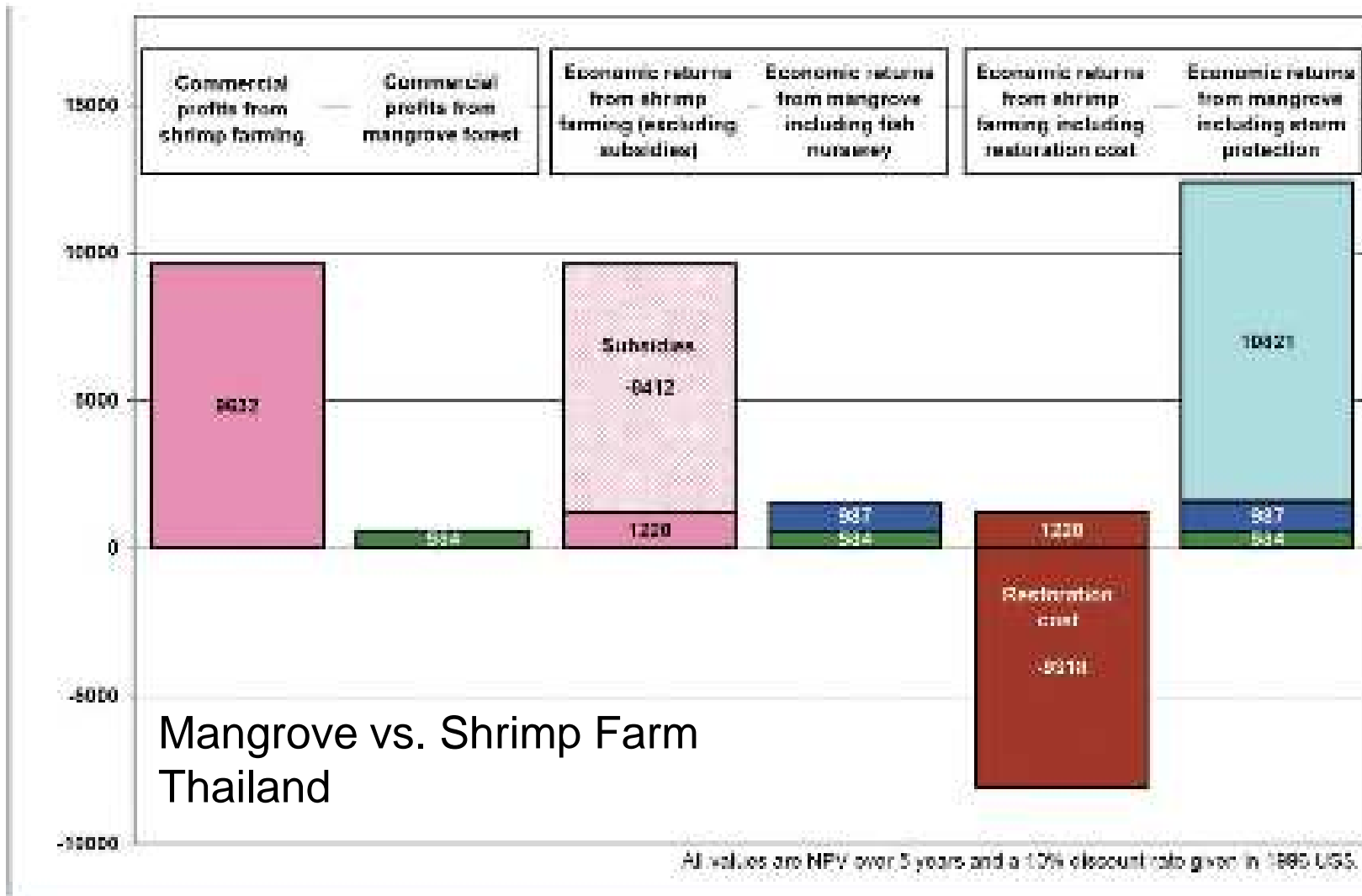


WHAT THEY ACTUALLY LOOK LIKE....





Private Profits, Public Losses...





Ecological Infrastructure for Adaptation



Federal Ministry for the
Environment, Nature Conservation
and Nuclear Safety

ADAPTING TO THREE BIG CLIMATE IMPACTS

- 1. Freshwater Scarcity** : Maintain and Restore Forests, Lakes, Wetlands
- 2. Agricultural & Fisheries Productivity** : Forests for nutrients and freshwater flows, Mangroves and Coral reefs as fish nurseries, and small-scale natural buffers (forest and grassland patches) agricultural areas
- 3. Natural Hazards** : Storm & Cyclone damage reduction through Coral reefs, mangrove forests ; flood and drought damage limitation through forest cover



Exceptional Returns from Ecosystem Restoration...



Federal Ministry for the
Environment, Nature Conservation
and Nuclear Safety

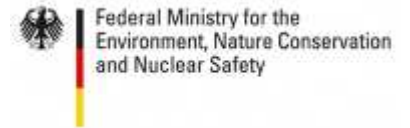
Table 3: Estimates of costs and benefits of restoration projects in different biomes

	Biome/Ecosystem	Typical cost of restoration (high scenario)	Estimated annual benefits from restoration (avg. scenario)	Net present value of benefits over 40 years	Internal rate of return	Benefit/cost ratio
		US\$/ha	US\$/ha	US\$/ha	%	Ratio
1	Coral reefs	542,500	129,200	1,166,000	7%	2.8
2	Coastal	232,700	73,900	935,400	11%	4.4
3	Mangroves	2,880	4,290	86,900	40%	26.4
4	Inland wetlands	33,000	14,200	171,300	12%	5.4
5	Lakes/rivers	4,000	3,800	69,700	27%	15.5
6	Tropical forests	3,450	7,000	148,700	50%	37.3
7	Other forests	2,390	1,620	26,300	20%	10.3
8	Woodland/shrubland	990	1,571	32,180	42%	28.4
9	Grasslands	260	1,010	22,600	79%	75.1

Note: Costs are based on an analysis of appropriate case studies; benefits have been calculated using a benefit transfer approach. The time horizon for the benefit calculation are 40 years (consistent with our scenario analysis horizon to 2050); Discount rate = 1%, and discount rate sensitivity by flexing to 4%, consistent with TEEB 2008). All estimates are based on ongoing analyses for TEEB (see chapter 7 TEEB D0 forthcoming). As the TEEB data base and value-analysis are still under development, this table is for illustrative purposes only.



PA Conservation : Jobs Opportunity ?

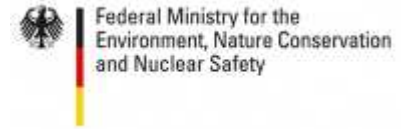


Measures Sectors	Revenues (USD Bio)	Capital Employed (USD Bio)	Direct Employment
Automobiles ⁴	\$ 1,882 Bio	\$2,217 Bio	4.4 Mio
Steel ⁴	\$ 530 Bio	\$ 588 Bio	4.5 Mio
IT Services & Software ⁴	\$ 942 Bio	\$ 179 Bio	5.7 Mio
Protected Area Conservation	\$ 4,500 Bio ¹	\$ 125,000 Bio ²	1.3 Mio ³

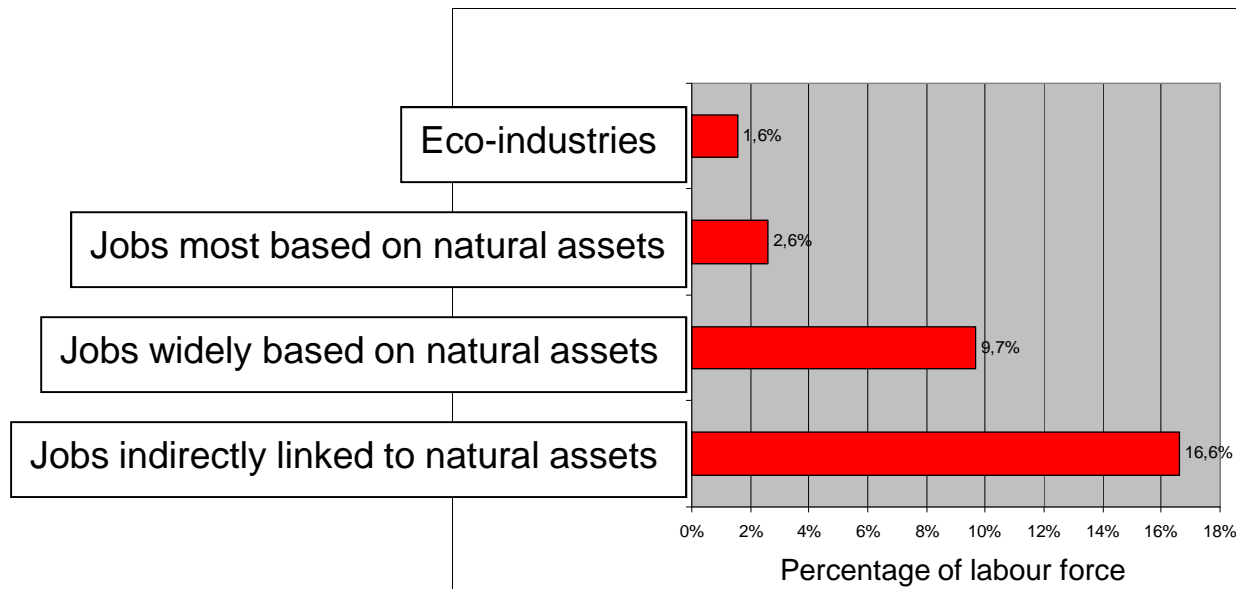
1. Balmford et al, 2002, "Economic Reasons for Conserving Wild Nature", Science 297, estimates Protected Areas could produce goods and services valued at between \$ 4,400 billion - \$ 5,200 billion per annum
2. Natural Capital : Present Value (PV) of a constant service annuity of \$ 5,000 billion per 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



European jobs linked to the environment

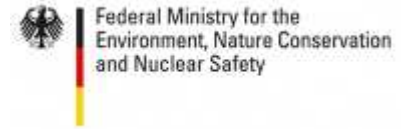


- clean tech 'eco-industries'
- organic agriculture
- sustainable forestry
- eco-tourism

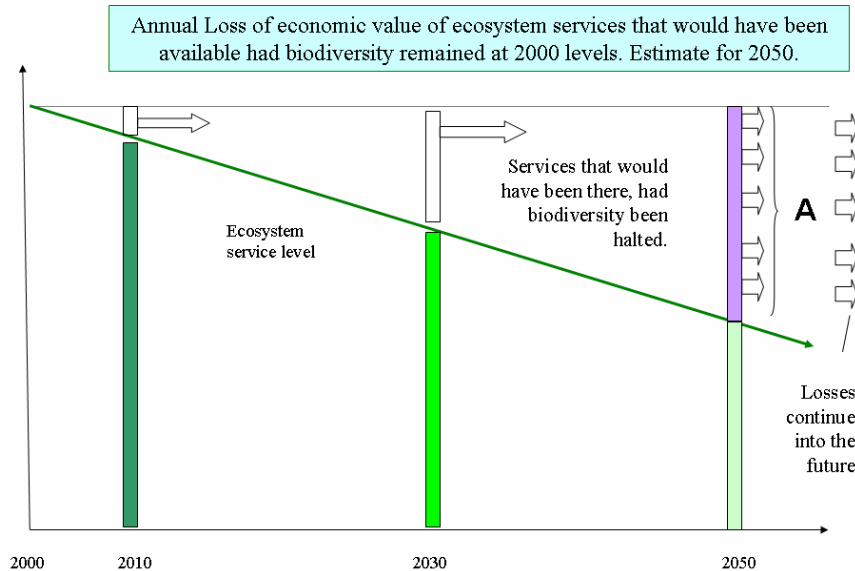




Economic Size & Welfare Impact of Losses



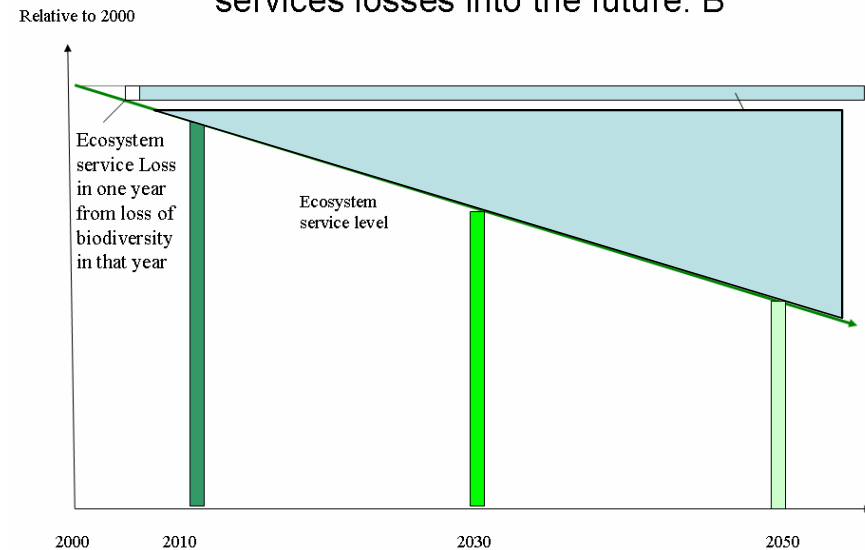
A : 50-year impact of inaction or 'business as usual'



Welfare losses equivalent to 7 % of GDP, horizon 2050

B : Natural Capital impact

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



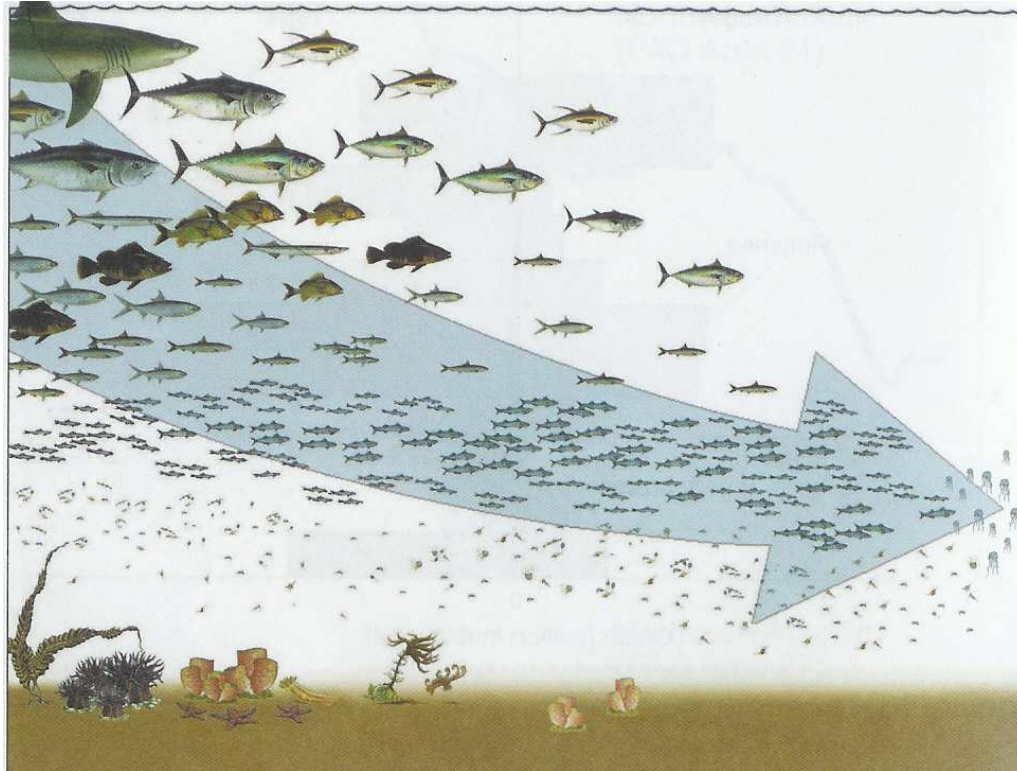
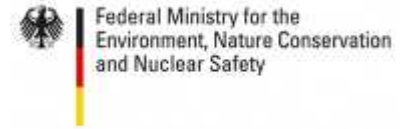
**Natural Capital Lost : Annually
EUR 1.35×10^{12} to 3.10×10^{12}**

(@ 4%
Discount Rate)

(@ 1%
Discount Rate)



Global Loss of Fisheries... Is there a Solution ?



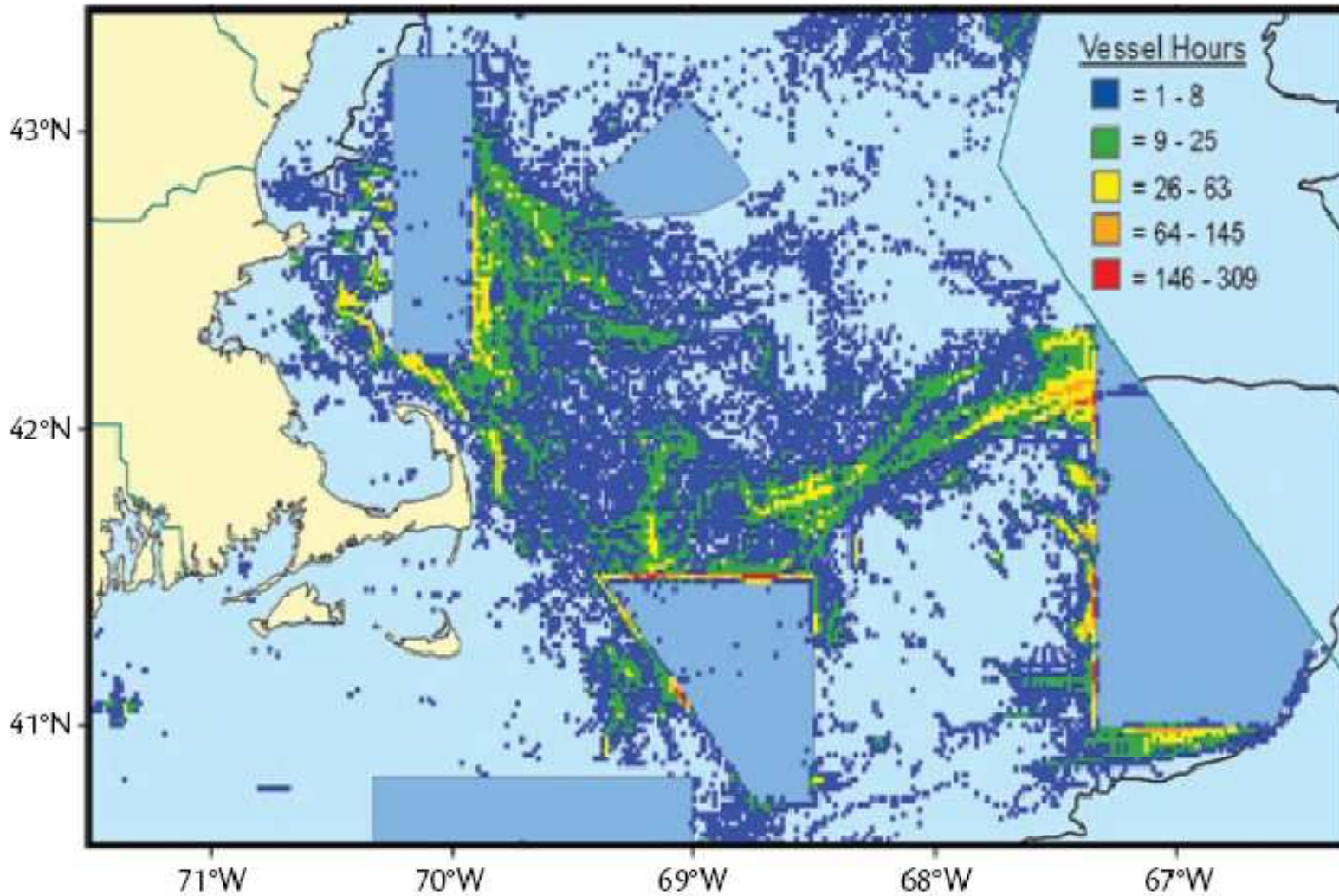
We are fishing down the food web to ever smaller species...



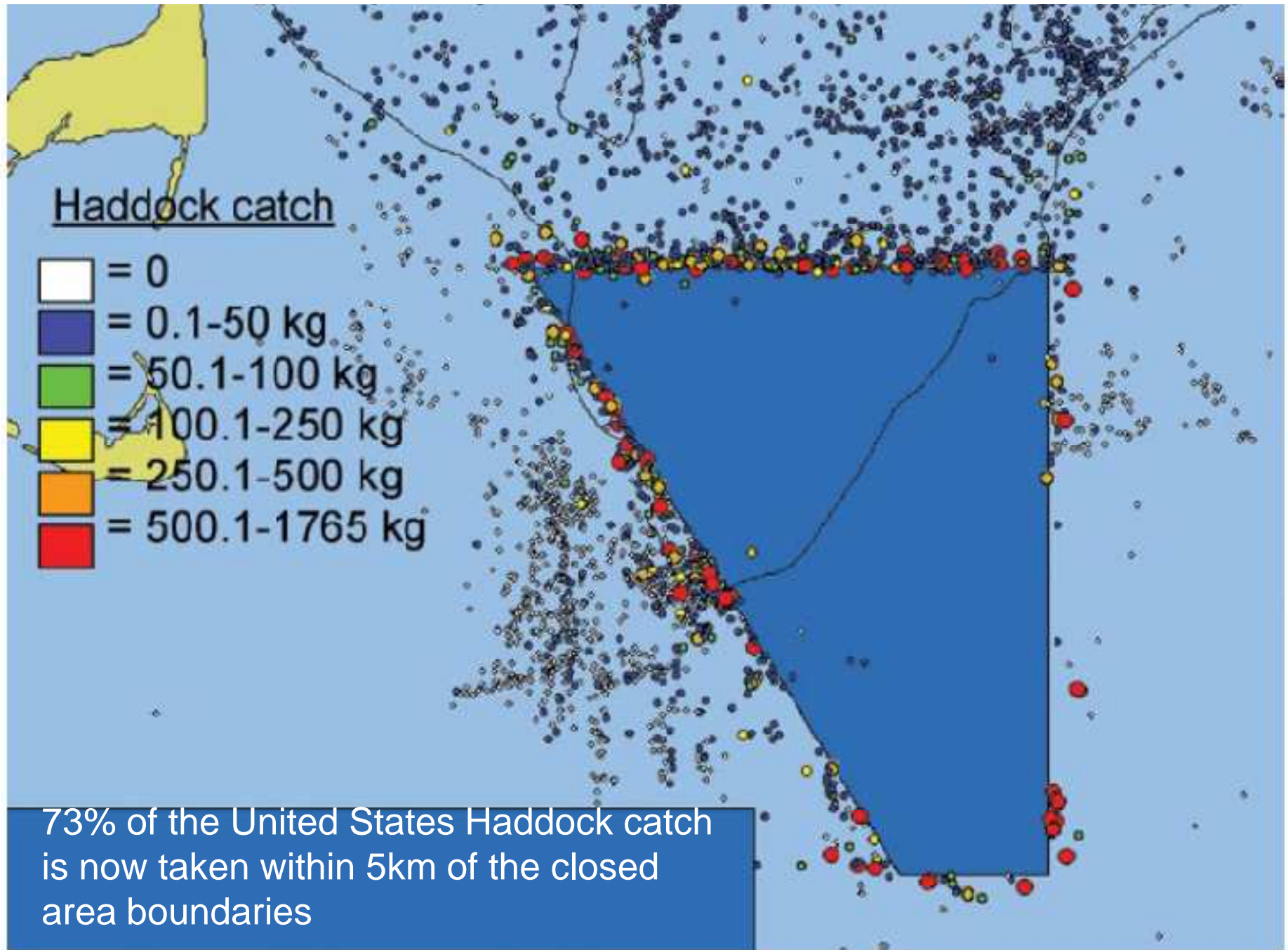
Reserves all over the world show dramatic increases in spawning stocks



Distribution of fishing effort around Georges Bank closed areas



Source: Fogarty et al. (2007)



Source: Fogarty et al. (2007)

**Catches
Increased
here too...**

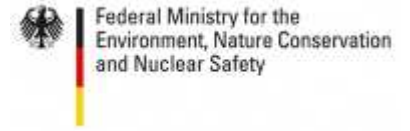


**Soufrière Marine Management
Area, St. Lucia : Established 1995
35% of reef area closed to fishing**

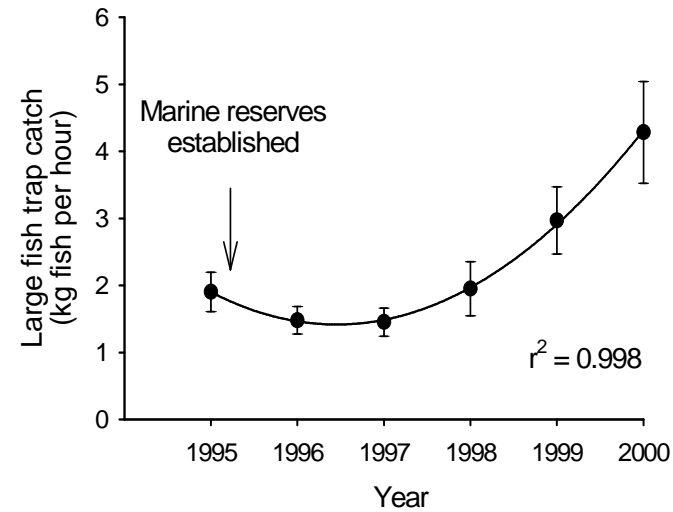




St. Lucia, Caribbean, Example

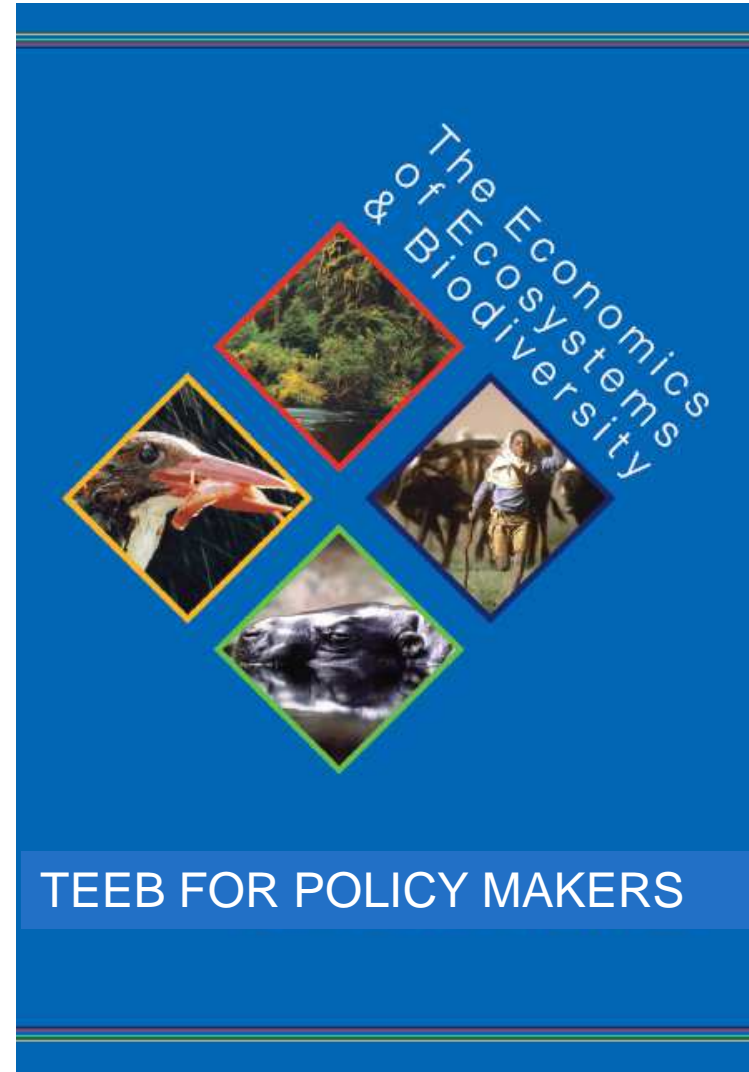
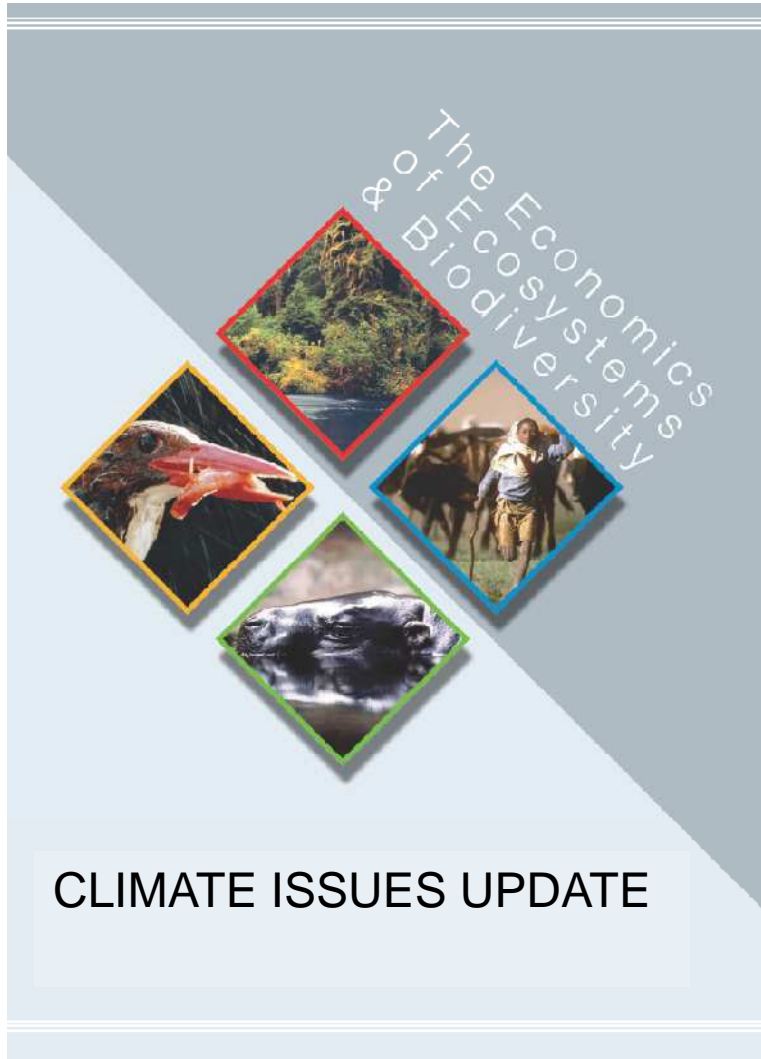


Fisherfolk now fish for less time and catch more than before reserves were set up





www.teebweb.org



The Economics of Ecosystems & Biodiversity



Thank you !

Further information

www.teebweb.org

