

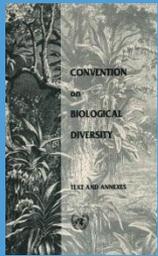
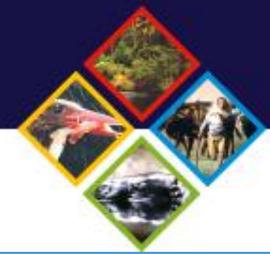
Bundles of Ecosystem Services

As support for optimizing sustainable land use

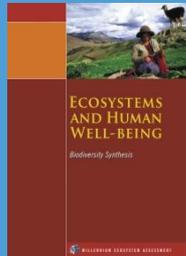
November 26th 2012, Kees Hendriks



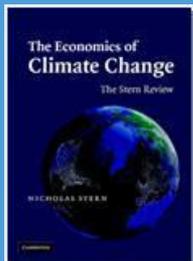
The Economics of Ecosystems & Biodiversity



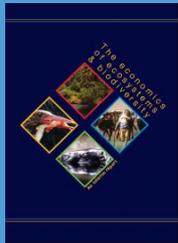
“Potsdam Initiative – Biological Diversity 2010”
 The economic significance of the global loss of biological diversity
 Importance of recognising, demonstrating & responding to values of nature
 Engagement: ~500 authors, reviewers & cases from across the globe



Ecol./Env. Economics literature



Interim Report



CBD COP 9
 Bonn 2008

Climate Issues Update



Input to UNFCCC
 2009

TEEB End User Reports
 Brussels 2009, London
 2010

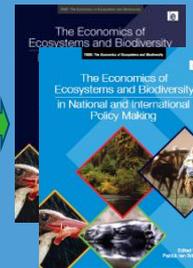


India, Brazil, Belgium,
 Japan & South Africa
 Sept. 2010

TEEB Synthesis



TEEB Books



CBD COP11
 Delhi

National TEEBs

- Netherlands**
- Nordics
- Norway
- Brazil
- India
- ...

Sectoral TEEB work

Water
Ag

Rio+20
 Brazil

BD COP 10 Nagoya, Oct 2010

TEEB Netherlands

Stakeholder committee

Regional governments, NGO's, companies

TEEB-NL steering committee (National Government EA, IE, FA, Cities)



The Netherlands



Mapping Ecosystem Services



PBL , Netherlands
Environmental
Assessment Agency,
2010

Stacking Ecosystem Services

Example
Forest

MULTIPLE USE ESS-LAYER: Σ Quantity/ Values

4TH ESS: RECREATION

3RD ESS: WATER PURIFICATION

2ND ESS: CARBON SEQUESTRATION

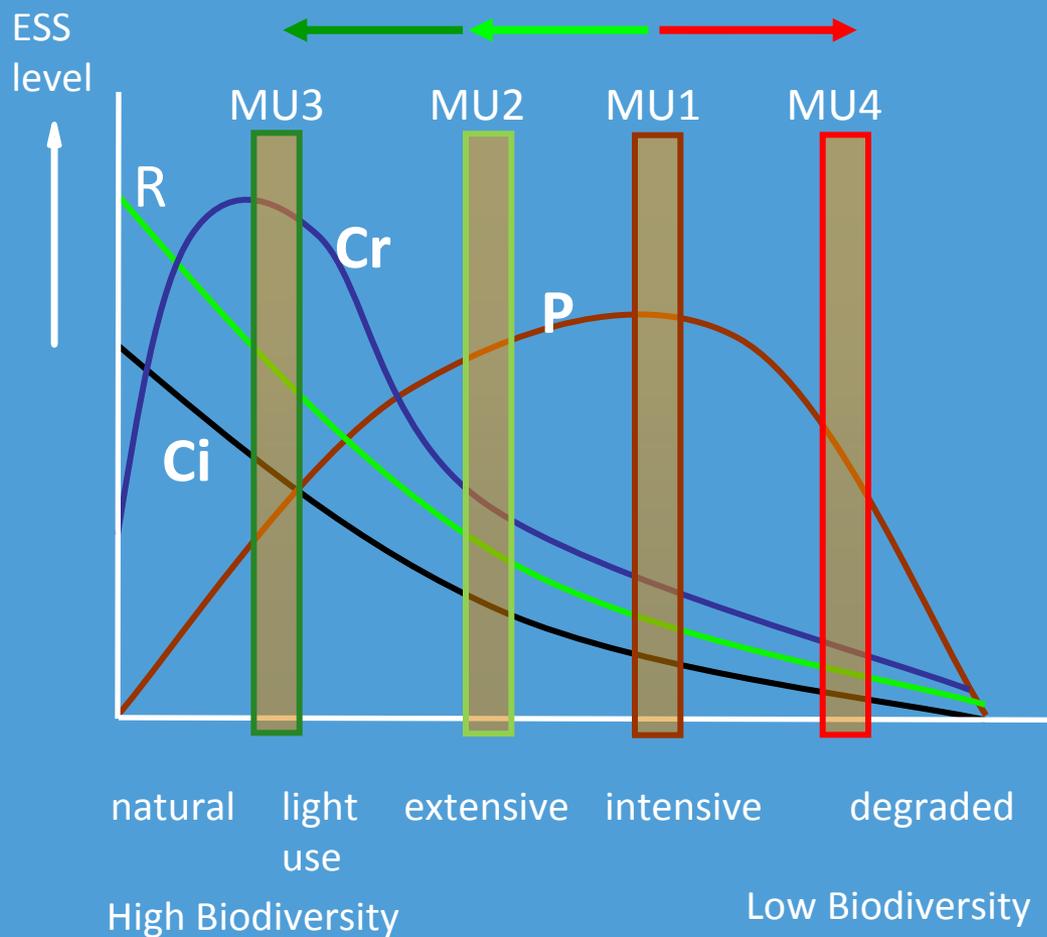
1ST ESS: WOOD

DOMINANT LAND USE: FOREST

Multiple use mapping



Ecosystem Services and land use options



P = Provisioning services

R = Regulating services

Cr = Cultural (recreation) services

Ci = Cultural (information) services

MU = Multiple Services per Land Use type

ESS = Ecosystem Services

Braat, 2010

(Developed from: Braat & Ten Brink, 2008)

Bundles in pilot area

Rijk van Dommel en Aa, The Netherlands

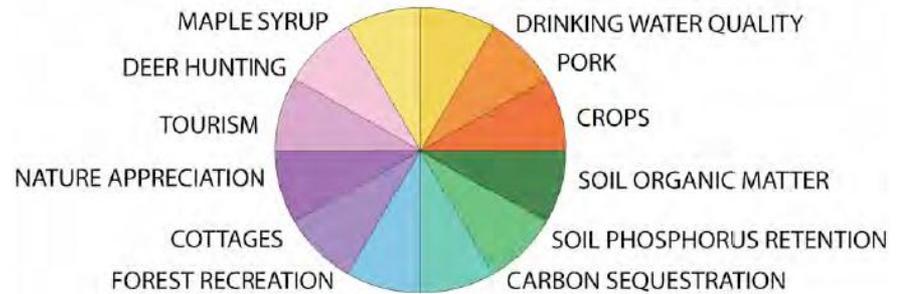
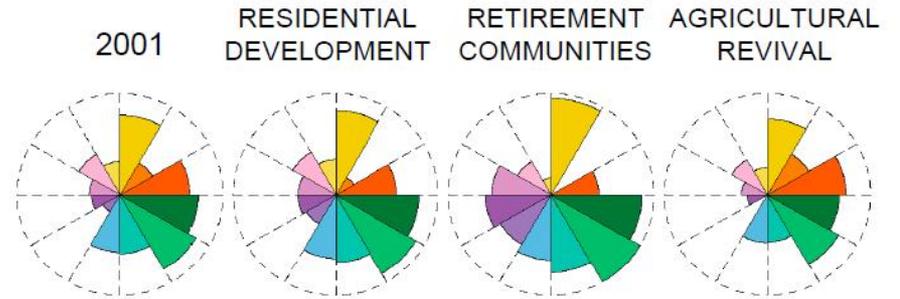
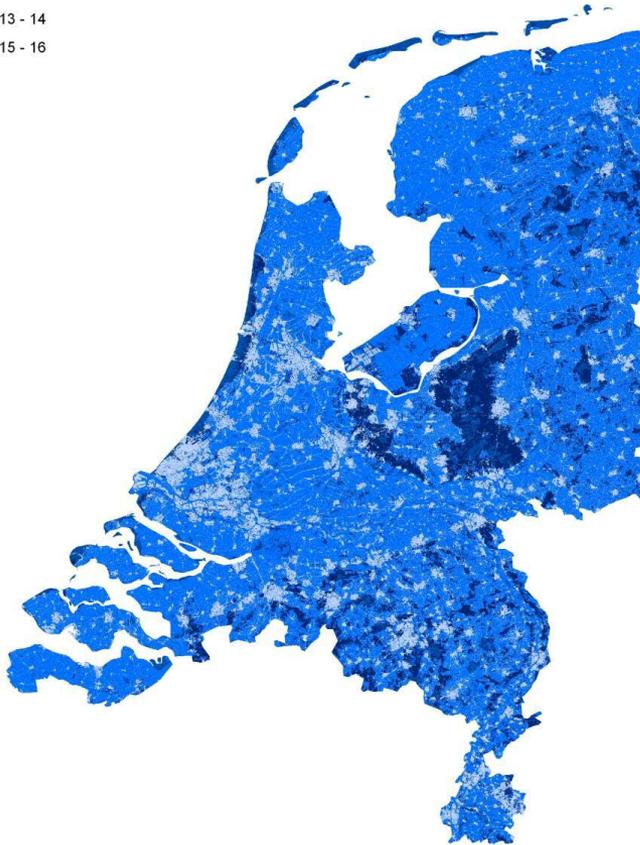
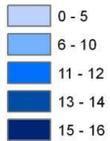
CASE STUDY SHEET Rijk van Dommel en Aa			Land use						
TEEB Classification			Pasture	Arable land	Other agricultural land	Deciduous forest	Coniferous forest	Other nature	Fresh water
PROVISIONING SERVICES									
	1	Food							
	2	Water							
	3	Raw materials							
	4	Genetic resources							
	5	Medical resources							
	6	Ornamental resources							
REGULATING SERVICES									
	7	Air purification							
	8	Climate regulation							
	9	Disturbance prevention							
	10	Regulation waterflows							
	11	Waste treatment							
	12	Erosion prevention							
	13	Maintaining soil fertility							
	14	Pollination							
	15	Biological control							
HABITAT SERVICES									
	16	Life cycle maintenance							
	17	Gene protection							
CULTURAL SERVICES									
	18	Aesthetic information							
	19	Recreation and tourism							
	20	Inspiration							
	21	Spiritual information							
	22	Cognitive information							

	much
	little
	few / none

Hendriks et al. in prep.

Stacking and Bundles

Number of ecosystem Services



Raudsepp-Hearne et al. 2010

Melman en van der Heide, 2011

Bundles of Ecosystem Services ...

Gain more insight in:

- Overview of well matching ESS and of excluding ESS
→ management optimizing ESS
- Ecological knowledge on production and regeneration with regard to sustainable use
→ management optimizing sustainable ES
- Compensation mechanisms for those who lose in trade-off
→ Payment for ecosystem services (PES)



Bundles of Ecosystem services

Questions ?

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