Integrating the concept of ecosystem services in planning & management at different scales

Workshop on „Ecosystem Services:
Solution for problems or a problem that needs solutions“ ?
Salzau, Germany May 13-15, 2008

(Ru)dolf de Groot

Associate Professor
Environmental Systems Analysis Group (ESA)

Environmental Functions as a Unifying Concept for Ecology and Economics

(The Environmentalist, Vol.7, No.2:105-109,1987)

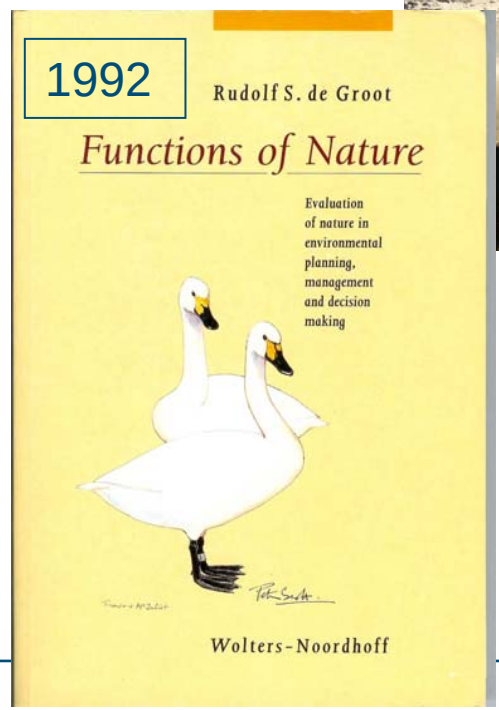
Rudolf S. de Groot*

Agricultural University Wageningen,
Ritzema Bosweg 32a,
6703 AZ Wageningen, The Netherlands

WAGENINGEN UNIVERSITY
WAGENINGEN UR

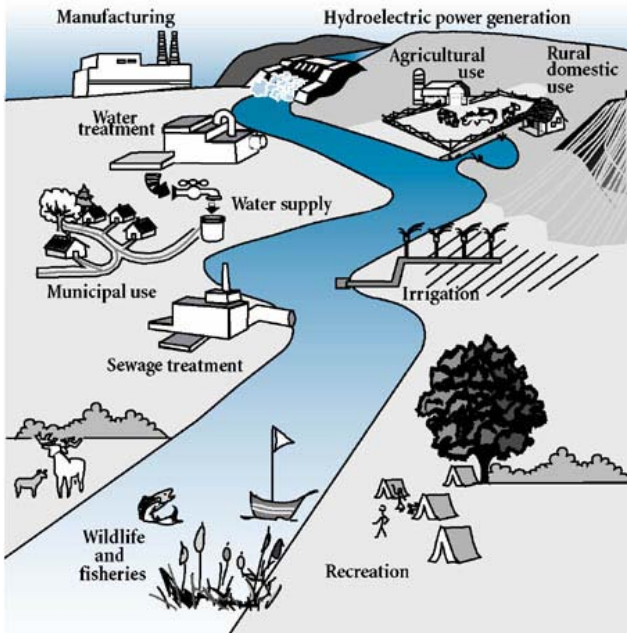
1980 Ecology of Owls In Galapagos

(pot) conflict Ecology - Economy



„Speerpunt“ Ecosystem & Landscape Services (SELS)

Program to stimulate new research (2006 - ….?), approx. 0,5 million €/year



How decide on optimal allocation and design of landscape/ecosystem functions & services ?

Key Questions

- How to translate **ecosystem/landscape properties** into functions, goods & services ?
- How to **quantify** and **value** ecosystem services ? (*ecological, socio-cultural and economic*)
- How to balance **trade-offs** in the use of ecosystem services in space and time ?
- How can ecosystem services be taken into account in landscape **design & management** ?
- Which **financing instruments** are most suited to stimulate / achieve sustainable use (& restoration) of ecosystem/landscape services ?
- How **communicate & visualise** ecosystem & landscape services ? *(“putting them on the map”)*

WAGENINGEN UR
For quality of life

Millennium Ecosystem Assessment

Millennium Ecosystem Assessment (2001-2005)

Consequences of Ecosystem Change for Human Well-being

1360 scientists from 95 countries www.MAweb.org

"Everyone in the world depends on nature and ecosystem services to provide the conditions for a decent, healthy, and secure life"

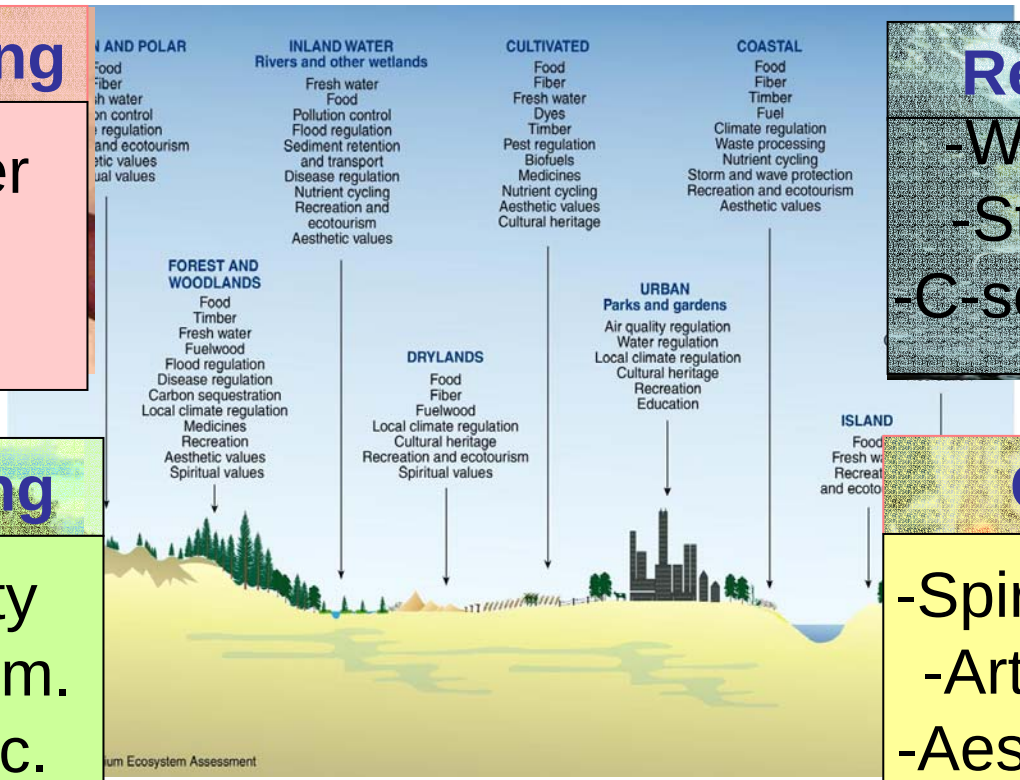
10 (Eco)systems -> 20 different services

Provisioning

-Food, Fiber
-Medicins
-etc

Regulating

-Water purif.
-Storm prot.
-C-sequest; -etc



Supporting

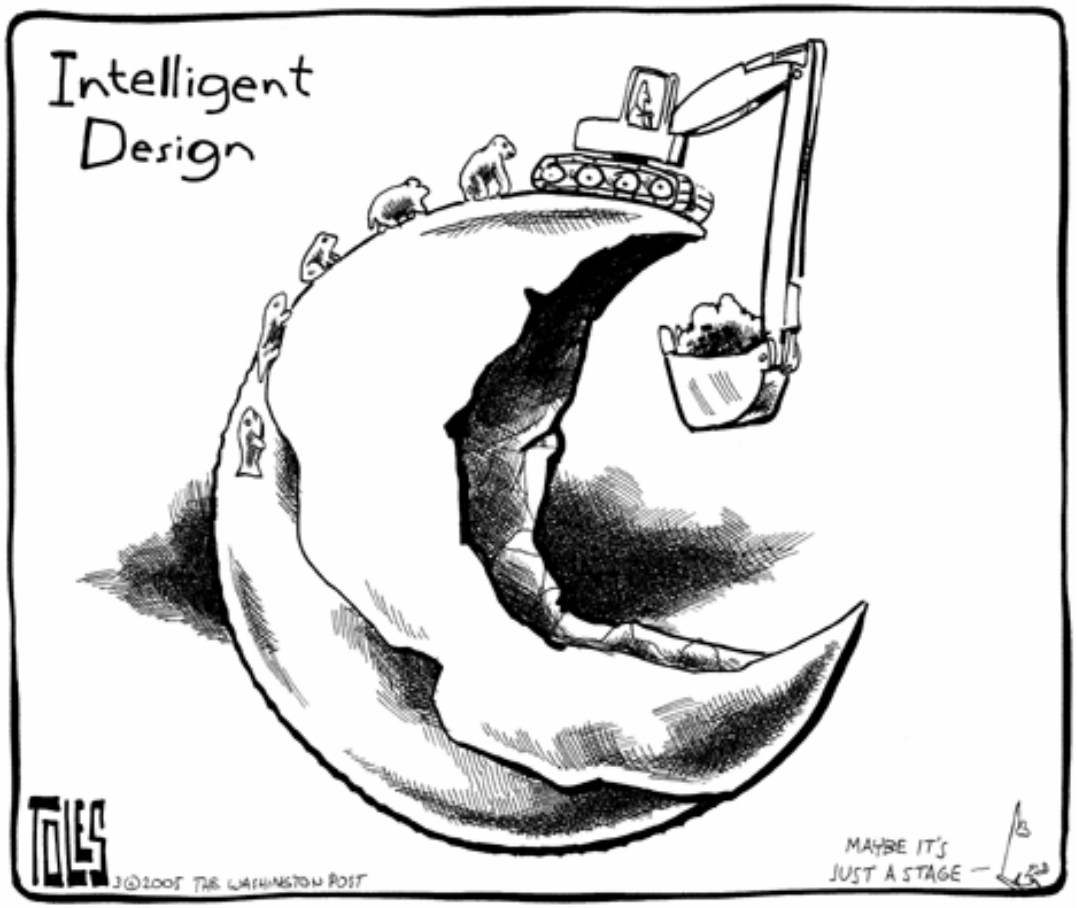
-Biodiversity
-Bio-geochem. cycles.; etc.

Cultural

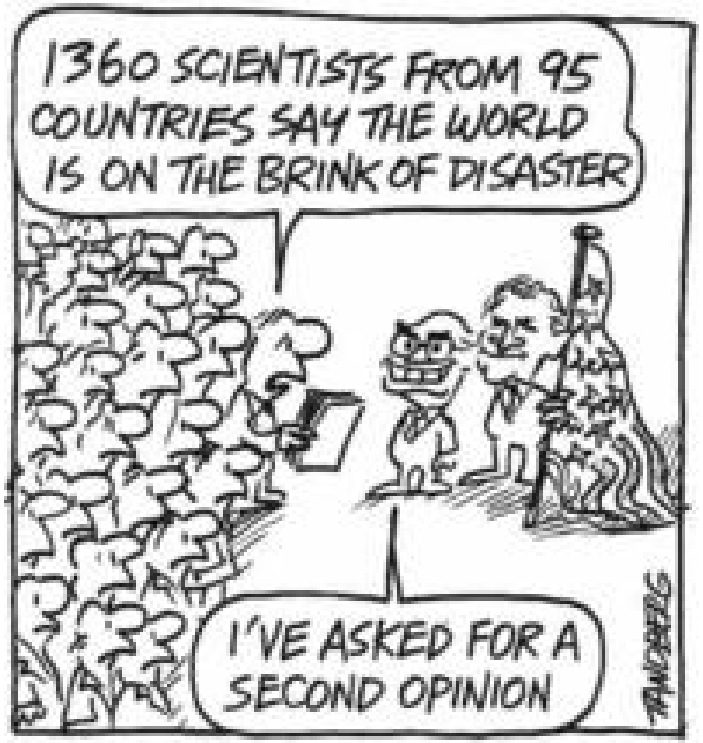
-Spiritual values
-Artistic inspir.
-Aesthetics, etc.

From natural and cultivated ecosystems

Media Coverage



Washington Post, 30 March 2005



The Austrialian, 30 March 2005

“Cost of Policy Inaction”

MA did not want to get into **monetary valuation** (too much) & did not resolve the problem of how to **define Ecosystem Services**

Review Economics of Biodiversity Loss: Scoping the Science

UNIVERSITY OF CAMBRIDGE · Institute for European Environmental Policy · WAGENINGEN UNIVERSITY · UNEP · WCMC

EC-project as contribution to CBD-COP9 (Bonn, May 2008)

Phase 1: preparation stage (before Bonn)
Phase 2: full review, to be ready in October 2009

Inspired by “Stern report” on costs of inaction against climate change (Economics of Climate Change, 2007)

Definitions of Ecosystem Functions and Services

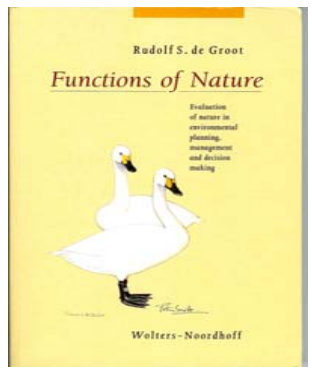
Ecosystem Services

-“conditions and processes through which natural ecosystems, and species …, sustain and fulfill human life” (Daily, 1997)

-“the benefits human populations derive, directly or indirectly, from ecosystem functions” (Costanza et al, 1997)

-”the benefits people derive from ecosystems” (Mill. Ecosystem Assessment, 2005)

Ecosystem Functions: „**Capacity** of ecosystem components and processes **to provide goods and services** that satisfy human needs (directly and indirectly)“ (De Groot, 1992 + De Groot et al, 2002)



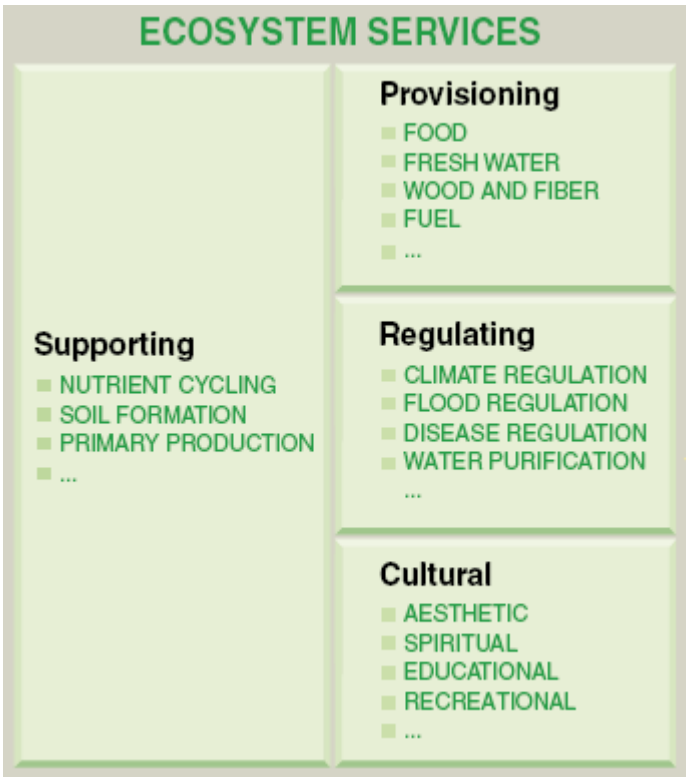
Problem/discussion:

Sevices are defined as a mix between (ecological) **functions** (eg. pollination, water regulation) and **benefits** (eg. food, drinking water) (e.g. Wallace, 2007)

Towards a new classification ?

This conference ??

Millennium Assessment (2005) "**Scoping the Science**" report (draft – May 2008)



Core ecosystem processes	Beneficial ecosystem processes	Benefits
-Production -Decompo-sition -Nutrient cycling -Water cycling - etc	-Biomass pr. -Pollination -Biological control -(formation of) Spec. Habitat -Waste Assim - etc	-Food -Fresh water -Raw materials -Energy -Physical & mental wellbeing - etc

“Application of Ecosystem Services in Planning & management (at different scales)”

“Solution for Problems”…

1.Optimize (multi-functional) land use and resource allocation

2. Impact assessment and sensitivity analysis

3. Cost-benefit analysis (of different Ecosystem Management states)

“…Problems that need solutions”

1. How to map / visualise ecosystem services ?
2. How to better represent ES in Decision/Plan. Support Tools ?
3. How to turn value into real money ? (for sust. use of ES)

Optimize (multi-functional) land use: local scale

Maybe priority list one of the results of this conference ?

Key questions (SELS-Theme 1):

- How can **relationships** between landscape and ecosystem characteristics and their functions and associated goods and services be identified and **quantified** ?
- What is the **spatial distribution** of E&L functions and how can they be mapped ?
- What is the effect of dynamic conditions (spatial and temporal) on services in terms of **sustainability and resilience** ?
- What are possible **critical thresholds** for ecosystem resilience and sustainability ?
- How can interactions between E&L functions and services be **modelled** ?

SELS Theme 1: Identifying and Quantifying Ecosystem & Landscape Functions and Services

Projects (co) funded by SELS:

- **Pest control** as landscape service (H. Baveco)
- Services of **multi-functional wetlands** (A. vd Werf)
- The influence of **vegetation on air quality** (A.Oosterbaan)

Related WUR projects

- **RUBICODE**: (R. Bugter)
- Indicators for ecosystem services (L. Braat, R. Alkemade)
- Ecosystem services from Soil (P. de Ruiter)
- Flow-regulation in a watershed (Wolfert & Corporaal)

Rationalising BIodiversity COnservation in Dynamic Ecosystems (RUBICODE) Cons. Action 2006 - 2009

Project coordinated by Paula Harrison,
Environmental Change Institute, University of Oxford
and Rob Bugter (dept.), Alterra (WUR, Nl)

E-conference to identify and discuss main issues

www.rubicode.net

www.rubicode.net

Funded under the European Commission
Sixth Framework Programme
Contract Number: 036890

RUBICODE concentrates on the "service providers" through the SPU concept (Luck et al. 2003):
Service Providing Unit = the components of biodiversity necessary to deliver a given ecosystem service at the level required by service beneficiaries

How much (of a species and its habitat) is needed to provide the service, eg. pollination, pest controle ?

Common songbirds catch over 100.000 insects each year. Eg: in Sabah (Indonesia), wild birds limit the abundance of caterpillars in commercial Albizia plantations, thereby reducing defoliation damage *(N-fix.; Acacia like tree)*

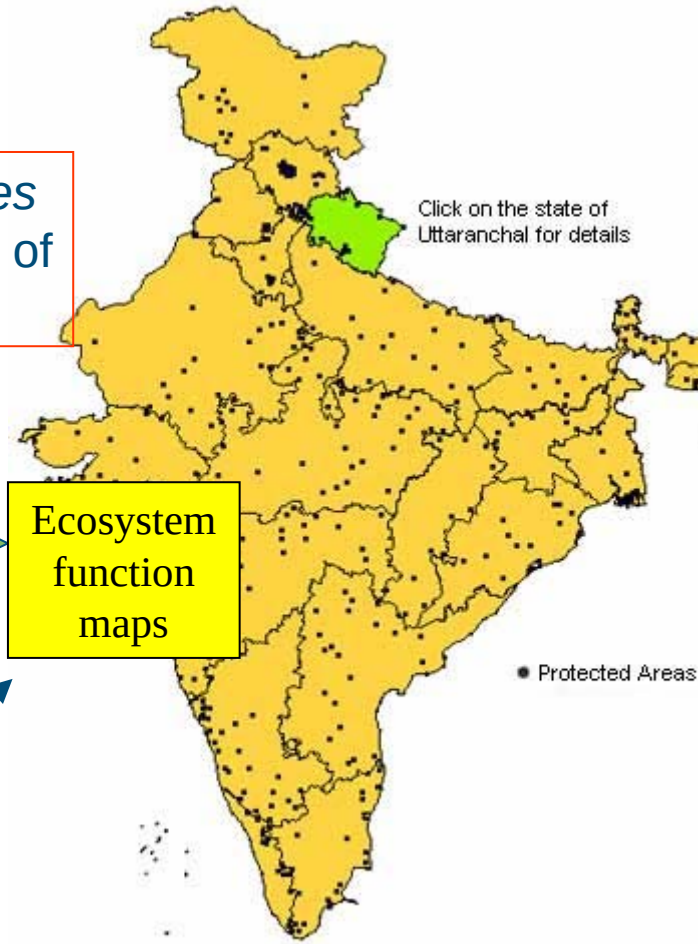
⇒ For nesting, the birds require natural forest stands near the plantations

Question: how many birds and (thus) how much forest is needed ?

Spatial Analysis of ecosystem functions provided by forests: a case study of Uttaranchal, India

Toni Puchol (student) + Michiel van Eupen (Alterra)
MSc Thesis, Environmental Sciences, 2006

Part of an EU project on .. *optimizing ecosystem services through improved planning and management strategies* of Forests in India, Germany and the Netherlands,



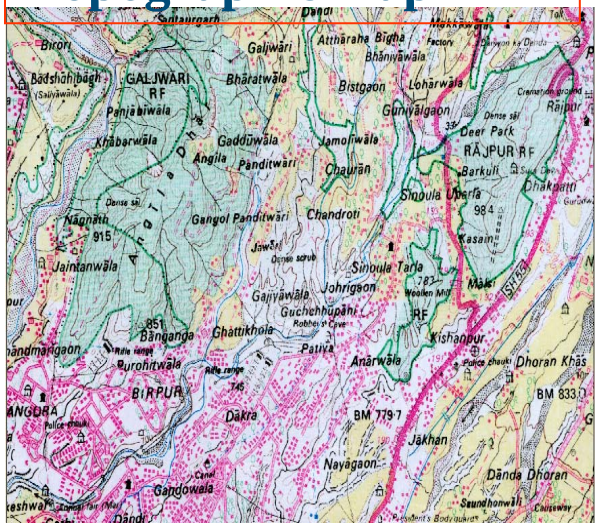
Spatial data from different sources → Thematic maps → Spatial indicators → Ecosystem function maps

Existing maps
Satellite images
Fieldwork

Regulation functions
(services / benefits)

Existing maps & remote sensing images

Topographic map



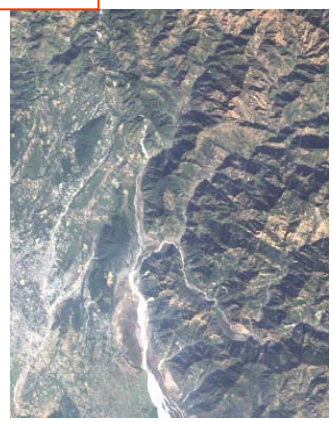
A thematic map (land use map) was built from a topographic map by means of a supervised classification

Land use map

Agriculture
Deodar
Miscel forest
Oak
Pine
Sal
Scrub
Settlements

Satelite images

- True Colour: band 1 is displayed in the blue colour, band 2 is displayed in the green colour, and band 3 is displayed in the red colour. The resulting image is close to realistic.



Normalized Difference Vegetation Index (NDVI). NDVI is calculated:

NDVI = (NIR — VIS)/(NIR + VIS)
NIR: Near infrared (band 4)
VIS: Visible (band 3)

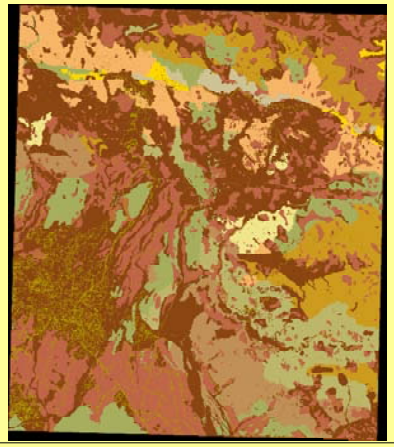
NDVI map

-1<NDVI<0;
0<NDVI<0.1;
0.1<NDVI<0.2;
0.2<NDVI<0.3;
0.3<NDVI<0.4;
0.4<NDVI<0.5;
0.5<NDVI<0.6;
0.6<NDVI<1

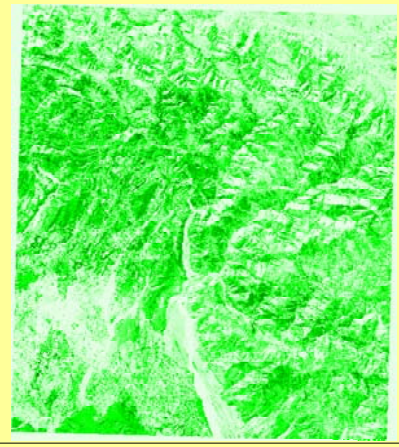
Mapping ecosystem regulation functions

THEMATIC MAPS:

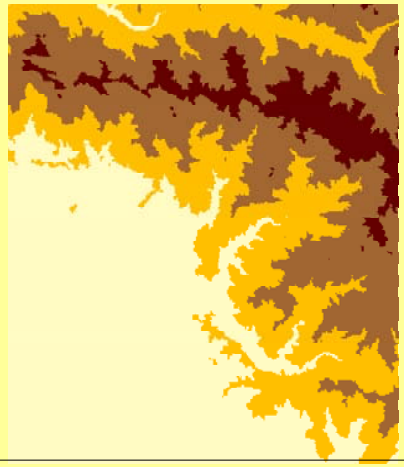
Land use map



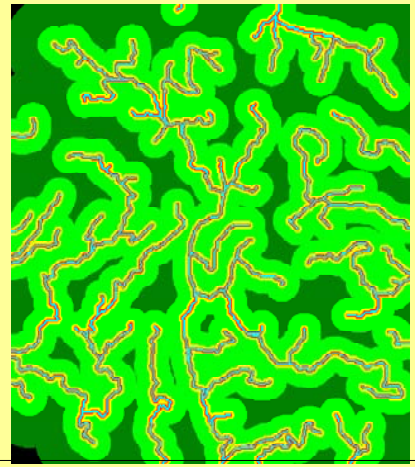
NDVI map



Elevation (thematic) map

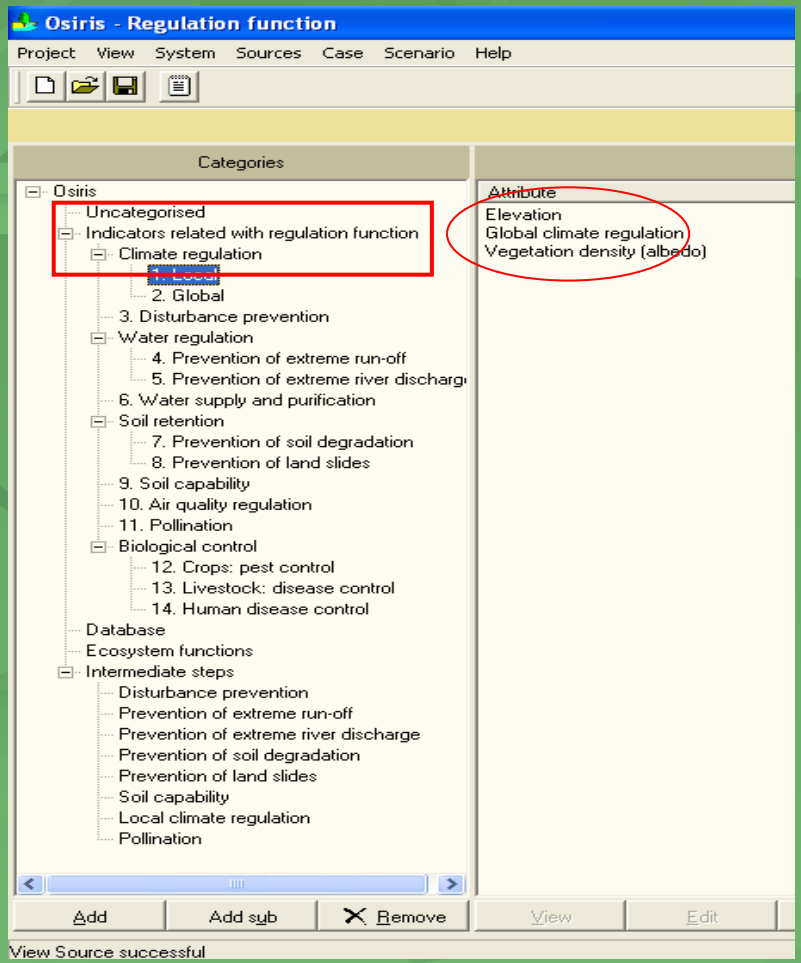


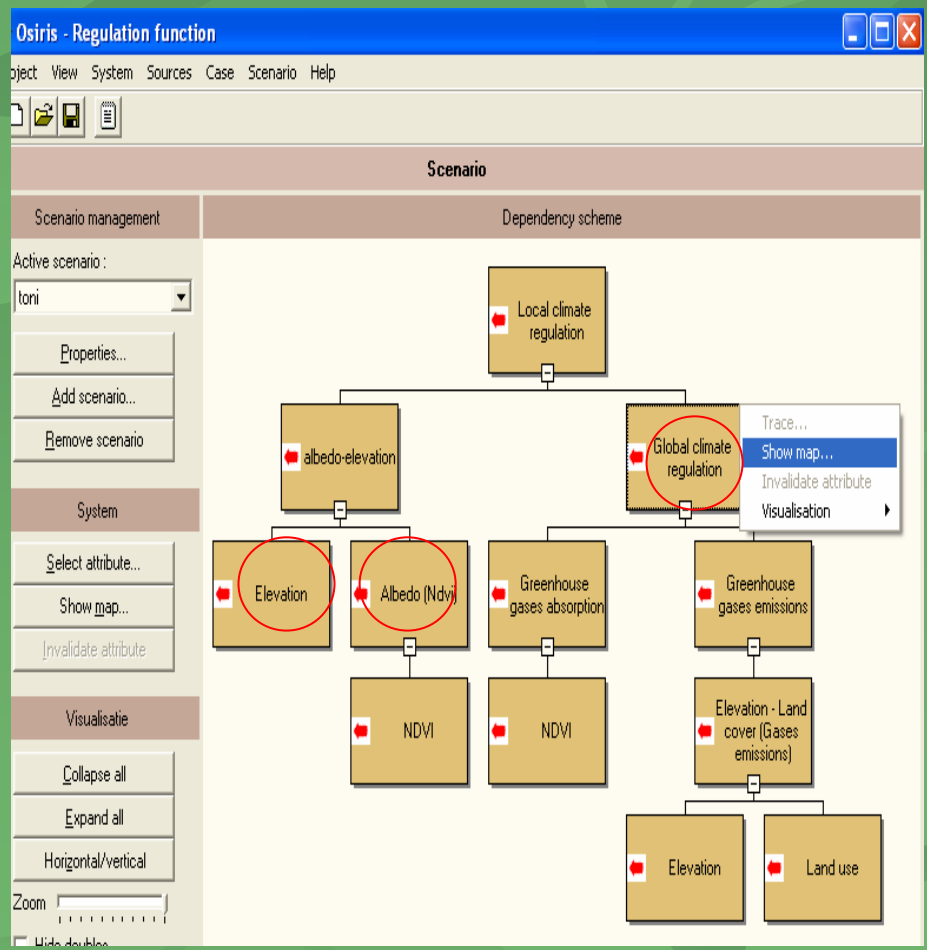
Distance to water accumulation (thematic) map

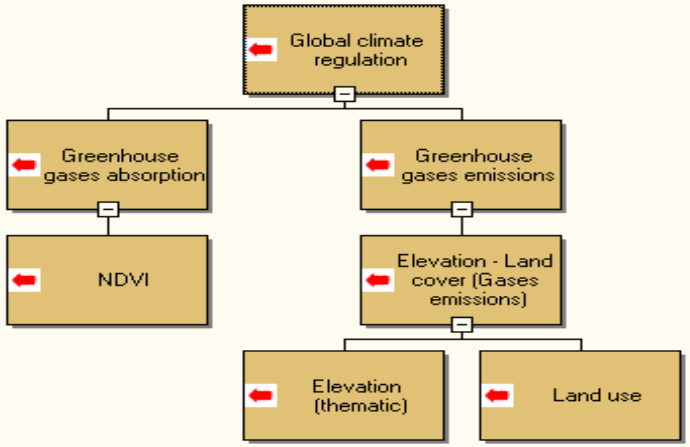


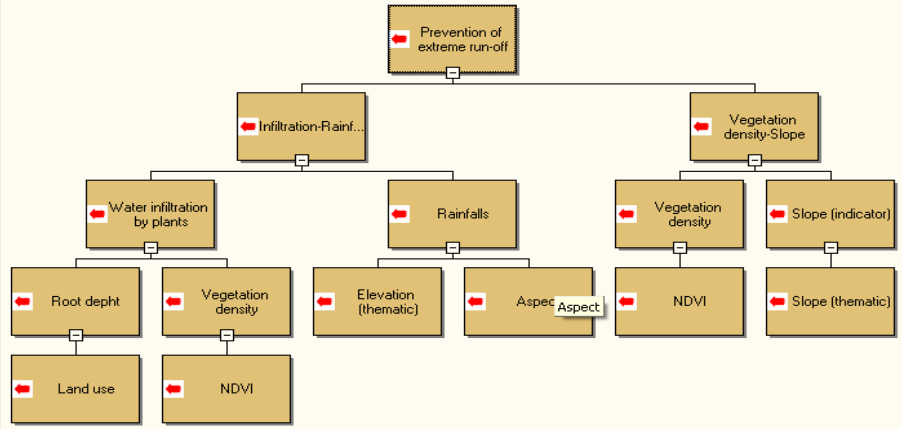
Mapping ecosystem regulation functions

The thematic maps were **translated or combined** in order to get the main features of the indicators for the ecosystem services, using spatial indicators [OSIRIS]

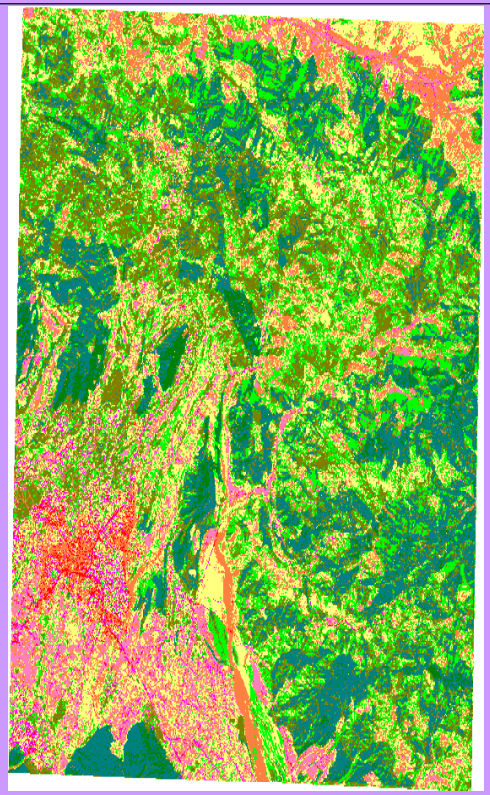


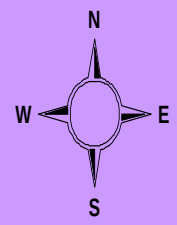




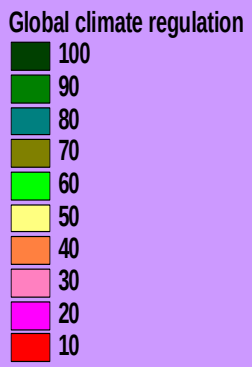


Global climate regulation map

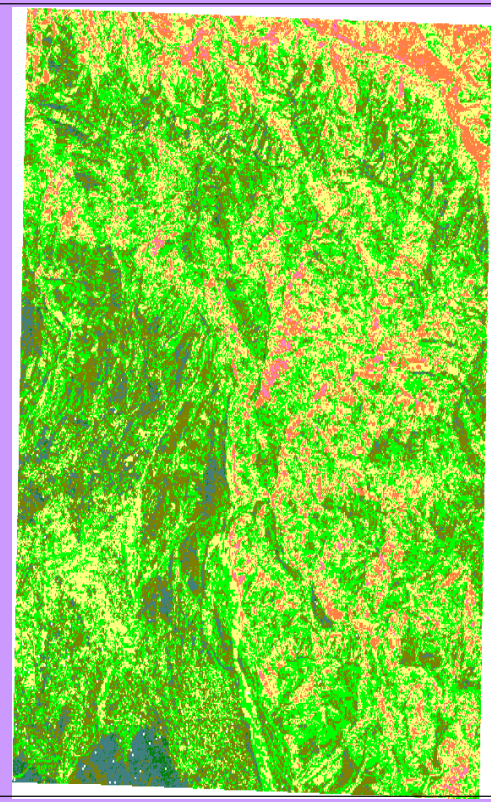


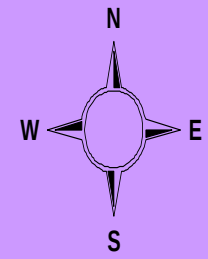


Global climate regulation



Prevention of extreme run-off map





Prevention of extreme run-off

+ Fieldwork (participatory mapping)

MLA (Multidisciplinary Landscape Assessment)

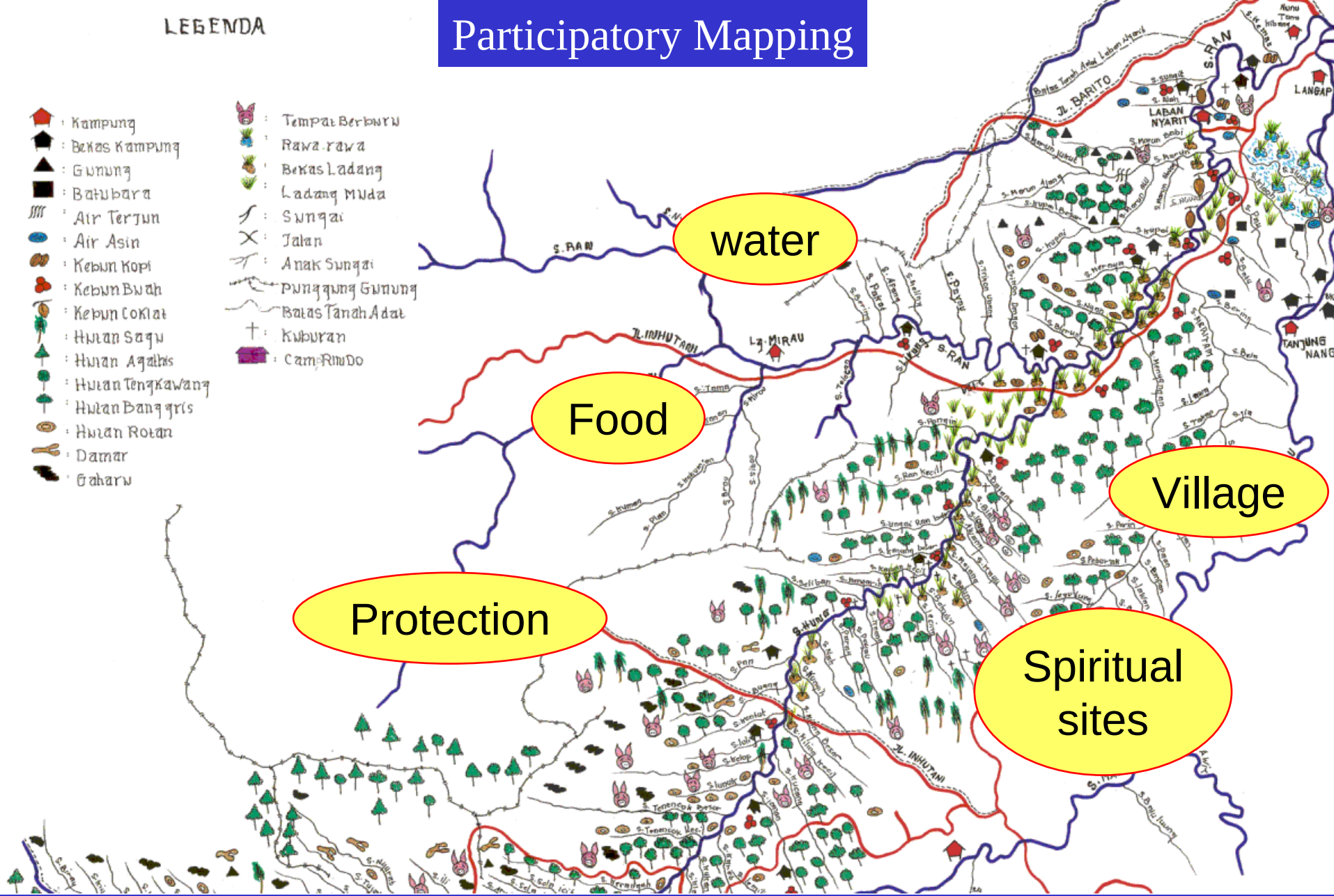
- an innovate methodology developed by CIFOR (Centre for International Forestry)

Household survey with questionnaire and Scoring exercises in focus group meetings.

PDM = Pebble distribution method

"How important is X compared to Y ?"

Participatory Mapping



Uses (services) of the forest

PDM results on land types: 7 communities

Ecosystems

Services

Land/forest type	Food	Medicinal	Light Construction	Heavy Construction	Boat Cons	Tools	Firewood	Basketry	Ornamen	Marketabl	Hunting Fu	Hunting Place	Recreation	Future
Village ground	11.29	15.50	1.43	2.32	0.25	1.82	1.61	2.68	13.21	9.21	7.04	0.11	17.75	13.04
Abandoned village	6.04	4.82	4.79	1.50	0.79	2.46	2.21	4.46	5.29	6.71	5.00	6.04	2.11	4.89
Horticulture	12.18	8.39	4.71	1.07	0.18	0.25	8.61	2.50	10.46	16.86	4.50	6.96	11.71	15.86
River	14.64	11.11	10.96	6.71	7.82	8.93	19.04	10.68	15.61	14.57	7.89	14.54	**26.57**	8.54
Swamps	7.29	5.71	9.21	9.21	11.50	10.57	3.89	7.93	3.79	4.36	5.57	7.25	1.50	7.21
Swidden	13.79	4.71	1.82	1.79	0.89	0.39	17.00	1.14	0.79	12.32	0.68	7.54	12.39	10.36
Young fallow	6.54	5.75	1.71	1.25	0.79	2.04	9.96	3.46	3.29	3.64	1.50	5.11	0.29	8.04
Old fallow	5.93	8.39	27.04	4.93	4.68	12.14	13.79	17.50	14.29	2.54	14.46	14.93	3.18	10.54
Forest	**22.32**	**35.61**	**38.32**	**71.21**	**73.11**	**61.39**	**23.89**	**49.64**	**33.29**	**29.79**	**53.36**	**37.54**	24.50	**21.536**
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Primary forest	**38.57**	**36.29**	**35.61**	**50.71**	**49.50**	**44.68**	29.07	**39.04**	**30.32**	35.79	**43.50**	**36.46**	**34.63**	**30.68**
Logged forest	7.61	8.18	8.61	5.89	4.61	5.11	15.89	5.86	9.96	8.43	4.93	7.25	8.14	12.71
Fallow	12.07	15.07	23.04	3.96	1.96	4.75	**35.57**	15.64	26.82	7.07	9.14	11.75	15.70	23.61
Swamp forest	10.71	12.71	12.11	10.00	15.46	14.57	10.14	14.68	12.14	12.36	13.71	15.57	17.54	13.68
Mountain forest	31.04	27.75	20.64	29.43	28.46	30.89	9.32	24.79	20.75	**36.36**	28.71	28.96	23.99	19.32
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100

1.2 Use of ecosystem services to optimize (multi-functional) land use:

Regional scale

Sustainability Impact Assessment Tools

for Environmental, Social and Economic Effects of Multifunctional Land Use in European Regions (ZALF (Germany), Alterra (Nl)

Key Objective

Develop science based forecasting instruments to support decision making on policies related to land use in European regions

Role of ESA in SENSOR (contribute to:

-Develop a participatory method to assess stakeholder preferences and values for different policy scenarios

-Explore effects of land use change on the capacity of landscapes to provide ecosystem goods and services

ENVIRONMENTAL SCIENCES GROUP WAGENINGEN UR

www.sensor-ip.eu

Analysis of change in ecosystem goods/services

Felix Kienast, Janine Bollinger, Rudolf de Groot, Marion Potschin, Roy Haines-Young, Peter Verburg, Iris Heller (April 2008) **Assessing landscape functions at the Continental Scale: a methodological framework**. Submitted to J. Env. Management

Define which land cover types and landscape conditions ‘support’ ecosystem services

↓

Map spatial distribution of ecosystem services

↓

Analyze effect of land use change on ecosystem services

Land characteristics

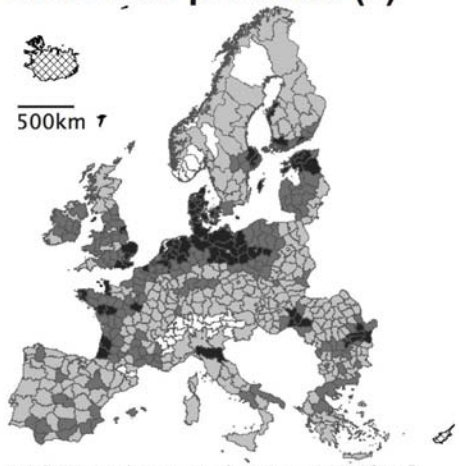
Define which land cover types and landscape conditions ‘support’ ecosystem services (in a given location)

Landscape functions (Lf)

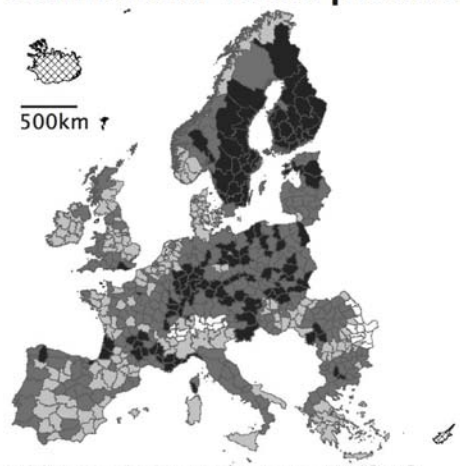
Land characteristics	Number of independent land characteristic	Wildlife products	Cultivated products	Commercial forest products	Transportation & housing	Energy(biofuel&renewable energy)	Climate regulation	Natural hazards reduction	Water regulation	Waste treatment	Erosion prevention	Biological control	Habitat function	Aesthetic information	Recreation & tourism	Cultural & artistic information
		Non-weighted links (nwl) between land characteristics and landscape functions (in a given location – Nuts-X) („0“ = indifferent role ; „1“ = supportive role)														
all Europe except arctic & steppic	1.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
arctic	1.2	1	0	0	0	0	1	0	1	0	0	0	1	1	0	1
steppic	1.3	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1
up to 1500m a.s.l	2.1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1
higher than 1500m a.s.l	2.2	1	0	0	0	1	1	1	1	0	0	1	1	1	1	1
coastline	3.1	1	1	0	1	1	0	1	1	0	1	0	1	1	1	1
artificial surface (Corine unit 1)	3.2	0	0	0	1	0	0	0	0	0	0	0	1	1	1	1
presence (100%) or absence (0%) of functional urban area with more than > 500000 inhabitants in NUTS-X region	3.3	0	0	0	1	0	0	0	0	0	0	0	1	1	1	1
arable land (Corine unit 2.1)	3.4	0	1	0	0	1	0	0	0	0	0	1	0	0	0	0
intertidal flats area (corine unit 4.2.3)	3.5	1	0	0	0	0	1	1	0	0	1	1	1	1	1	0
forested area (Corine unit 3.1)	3.6	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1
heterogeneous agric. areas (Corine unit 2.4)	3.7	1	1	0	0	1	0	0	1	0	1	1	1	1	1	1
open space with little or no vegetation (Corine unit 3.3)	3.8	1	0	0	0	0	0	0	0	0	0	0	1	1	1	0
pastures (Corine unit 2.3)	3.9	1	1	0	0	0	0	0	0	0	0	0	1	1	1	1
permanent crops (Corine unit 2.2)	3.10	0	1	0	0	0	0	0	0	0	0	1	0	1	1	0

Map spatial distribution of ecosystem services

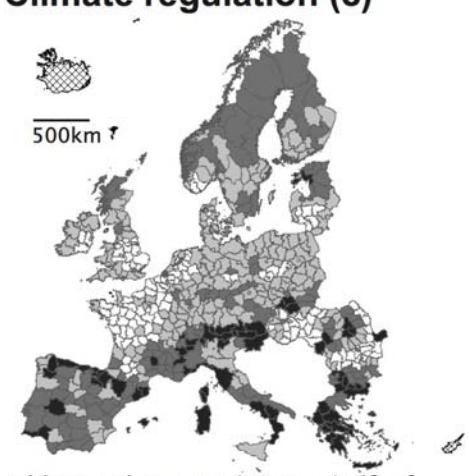
Cultivated products (a)



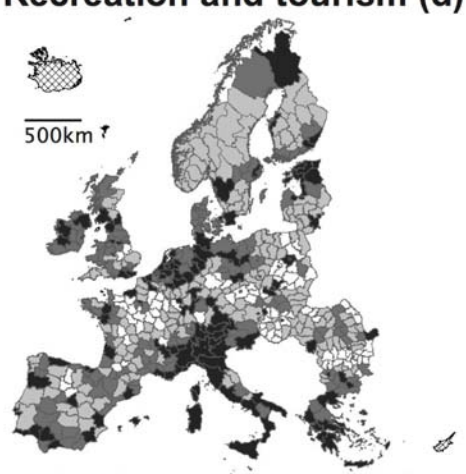
Commercial forest products (b)



Climate regulation (c)

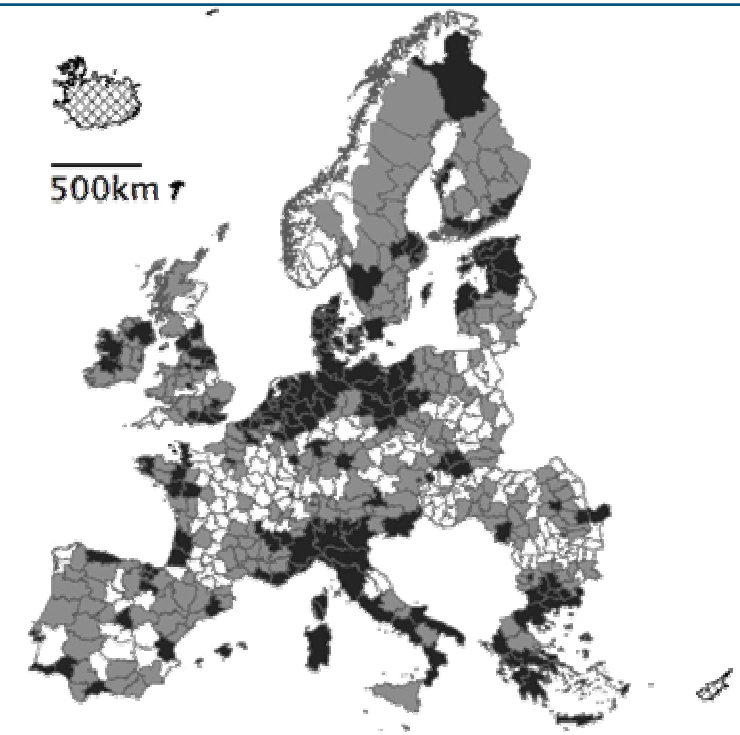


Recreation and tourism (d)

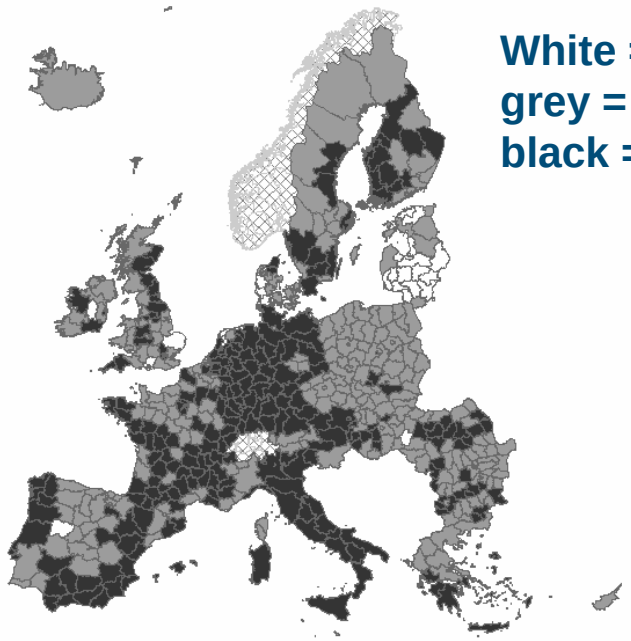


WAGENINGEN UN
WAGEN

Multifunctionality 2000
(9 landscape/land use functions)



Projected (relative) change in Recreation and tourism by year 2030 (A1 scenario)



White = decrease
grey = stable
black = increase

Analyze effect of land use change on ecosystem services

=> Need modeling ..

Spatial characteristics of landscape functions

Louise Willemen (PhD-student)

Landscape functions: capacity of a landscape to provide goods and services

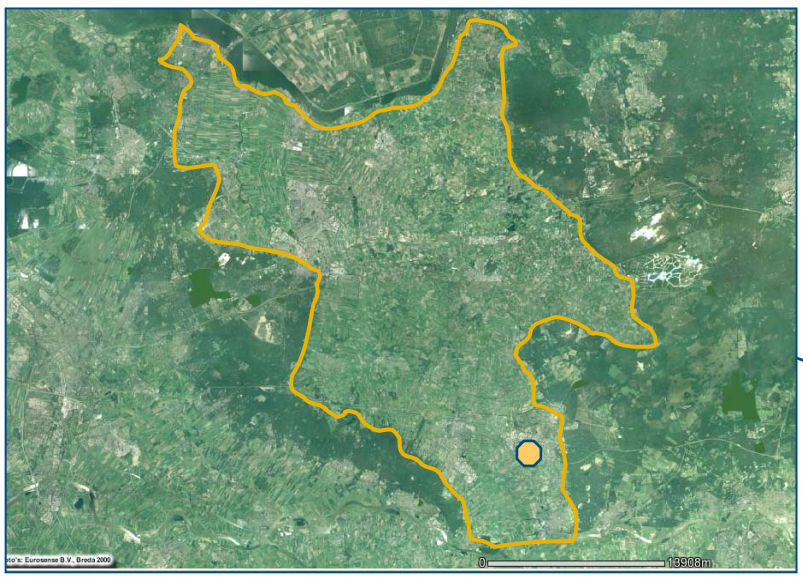
Many of the current descriptive landscape models are only focusing on directly observable functions

Need: To map the extent and capacity of observable and non-observable landscape functions

WAGENINGEN UNIVERSITY
WAGENINGEN UR

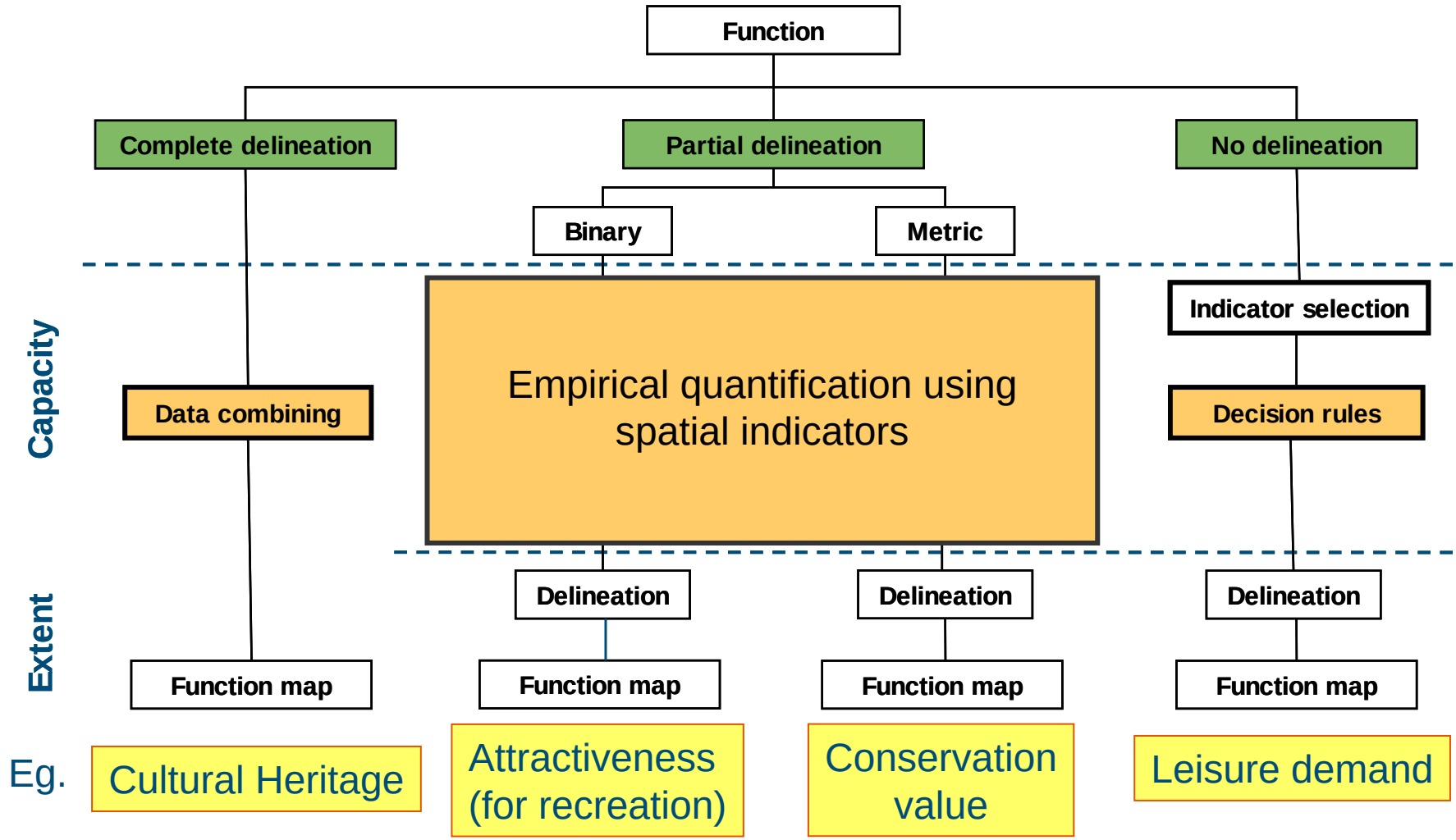
Study area

Transitional rural area, the Gelderse Vallei, in the highly populated Netherlands



approx. 25 X35 km

Methodology



Landscape function extents

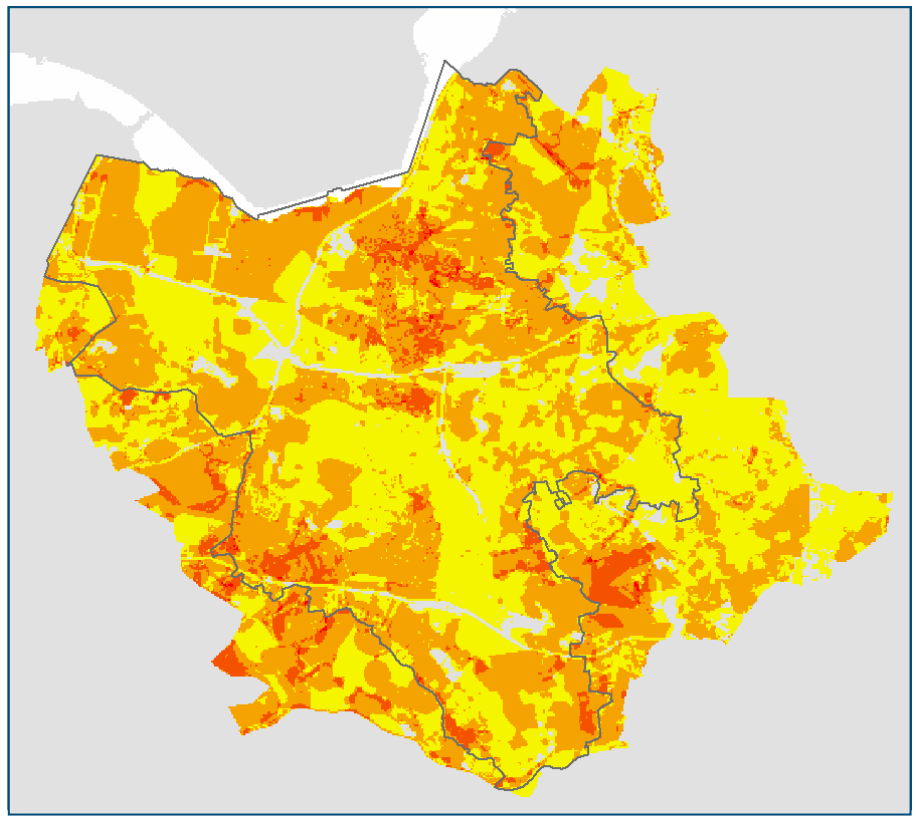
Thresholds

Cultural heritage: > defined extent

Tourism: > 0.50 (probability)

Nature: > 5 CV (distribution)

Leisure: > 10.000 (literature)



Multifunctionality (1-4)

Discussion / questions

- Which indicators on which scale level are needed to appropriately map landscape functions?
- How do function extent and capacity correlate?

  (what are the thresholds (by function and for multi-functional use ?)
- How can landscape dynamics (space and time) be included in function modelling?

- http://www.cluemodel.nl
- http://www.eururalis.eu
- http://www.sensor-ip.org

Solution for Problems – 2:

2. Impact assessment and sensitivity analysis
   - e.g. oil pollution, infrastructure (roads, dams, etc)

Thesis Research

Environmental and Socio – Economic costs of damage assessment for oil spill response management in Lithuanian coastal areas, South - Eastern Baltic Sea

Daniel Depellegrin, MSc-student
Environmental System Analysis
Wageningen University, The Netherlands

Thesis Supervisor:
Dr. Rudolf S. de Groot
Environmental Systems Analysis group
Wageningen UR (www.wur.nl)

Advisor:
Dr. Nerijus Blažauskas
Coastal Research and Planning Institute,
Klaipeda University (www.corpi.ku.lt/)

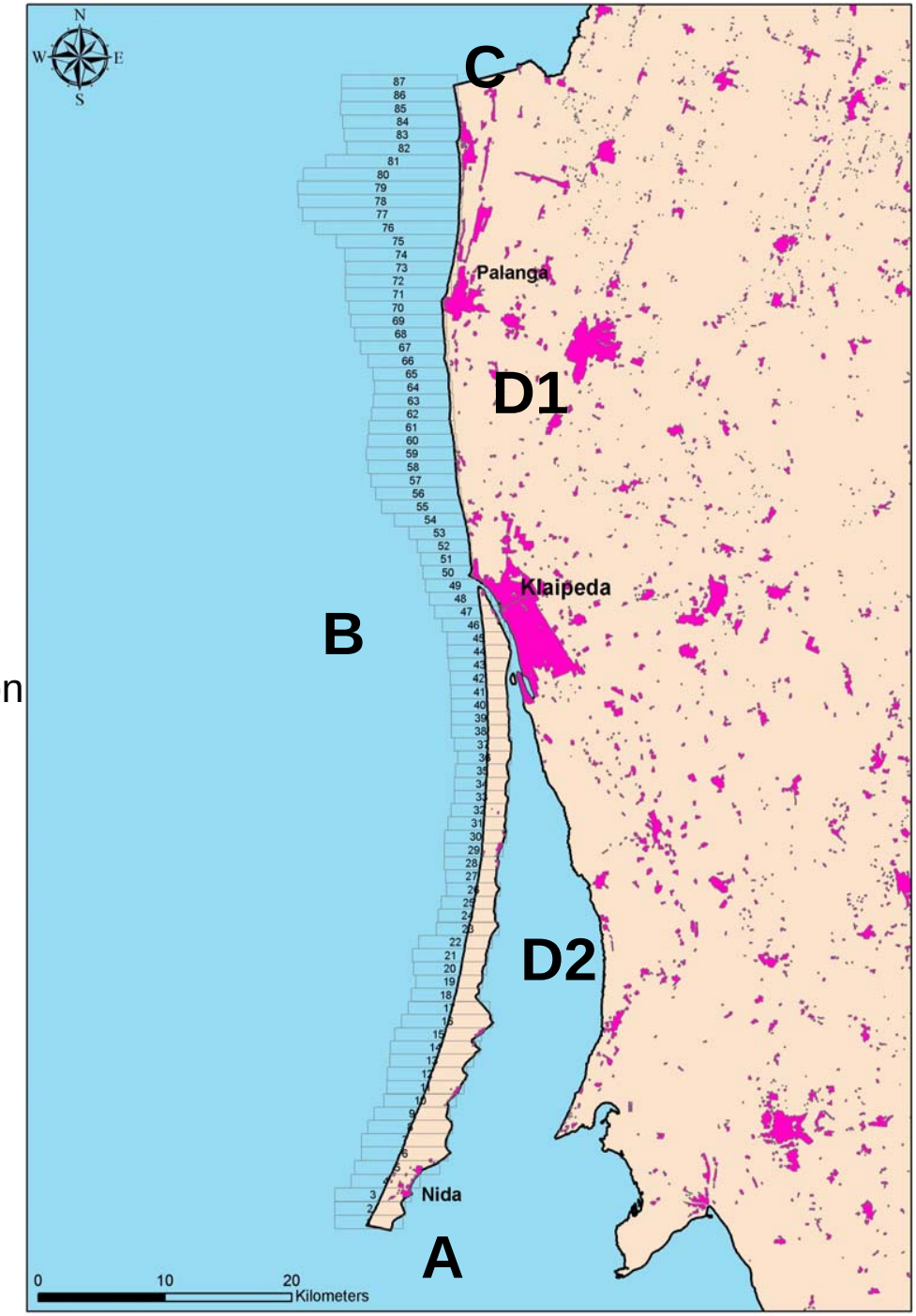
Study area

•Lithuanian Coast is 92 km long

A: National Border, Kaliningrad District (Russia)
B: 20 m isobath
C: National Border, Latvia
D1: 300 m inland
D2: East Coast Curonian Spit

• **Coastal Cell System**: based on definition of „*Coastal Stripe*“ from the ICZM Strategic Guidelines from the Natural Protection Dept. , Min. of Env. of the Republic of Lithuania

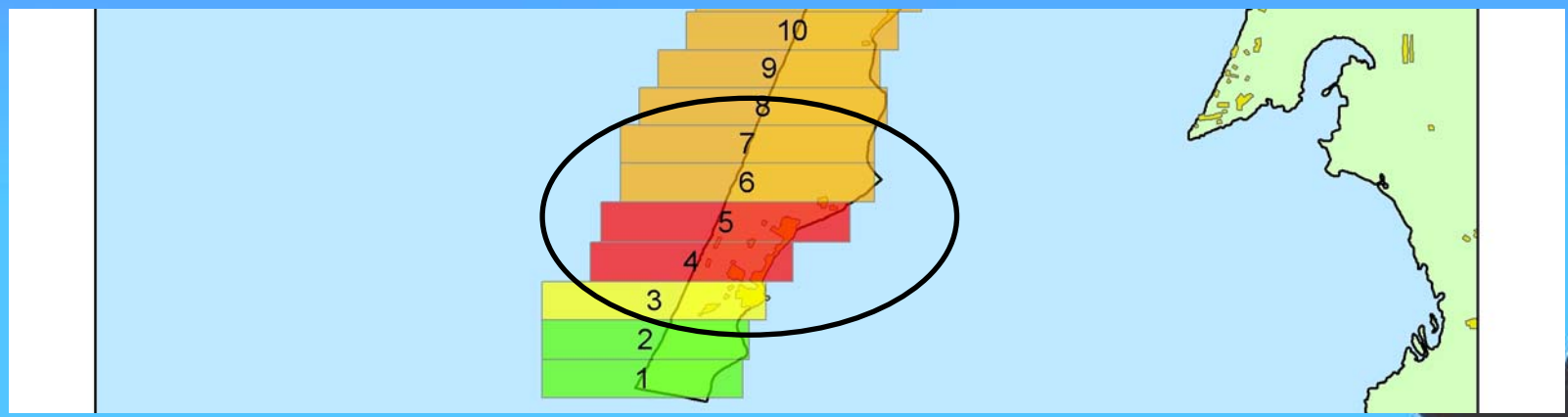
• **sensitivity analysis** based on 87 cell coastal cells
• Variable area: 3,7 – 13 km²



Calculating the sensitivity index for each cell

Example: Overall Sensitivity (based on 4 variables)

Cell _nr	Coast_feat. **(1) WV = 0,2**	Biol_res **(2) WV =0,3**	Soc_eco **(3) WV = 0,3**	Fish_res **(4) WV = 0,2**	ALGORITHM	ESI	RANGE
5	AV5xWV1	AV5xWV2	AV5xWV3	AV5xWV4	Σ AV5(1-4) x WV(1-4)	24	**Very high**
6	AV6xWV1	AV6xWV2	AV6xWV3	AV6xWV4	Σ AV6(1-4) x WV(1-4)	20	**high**
7	AV7xWV1	AV7xWV2	AV7xWV3	AV7xWV4	Σ AV7(1-4) x WV(1-4)	20	**high**



Results

- Overall Environmental Sensitivity Map based on coastal cells
- 49 cells
- Average sensitivity MODERATE-HIGH
- 3 main sensitivity areas:
  - southern and northern border — low
  - North of Nida area — very sensitive
  - Central area (Juodkrante) — low –moderate

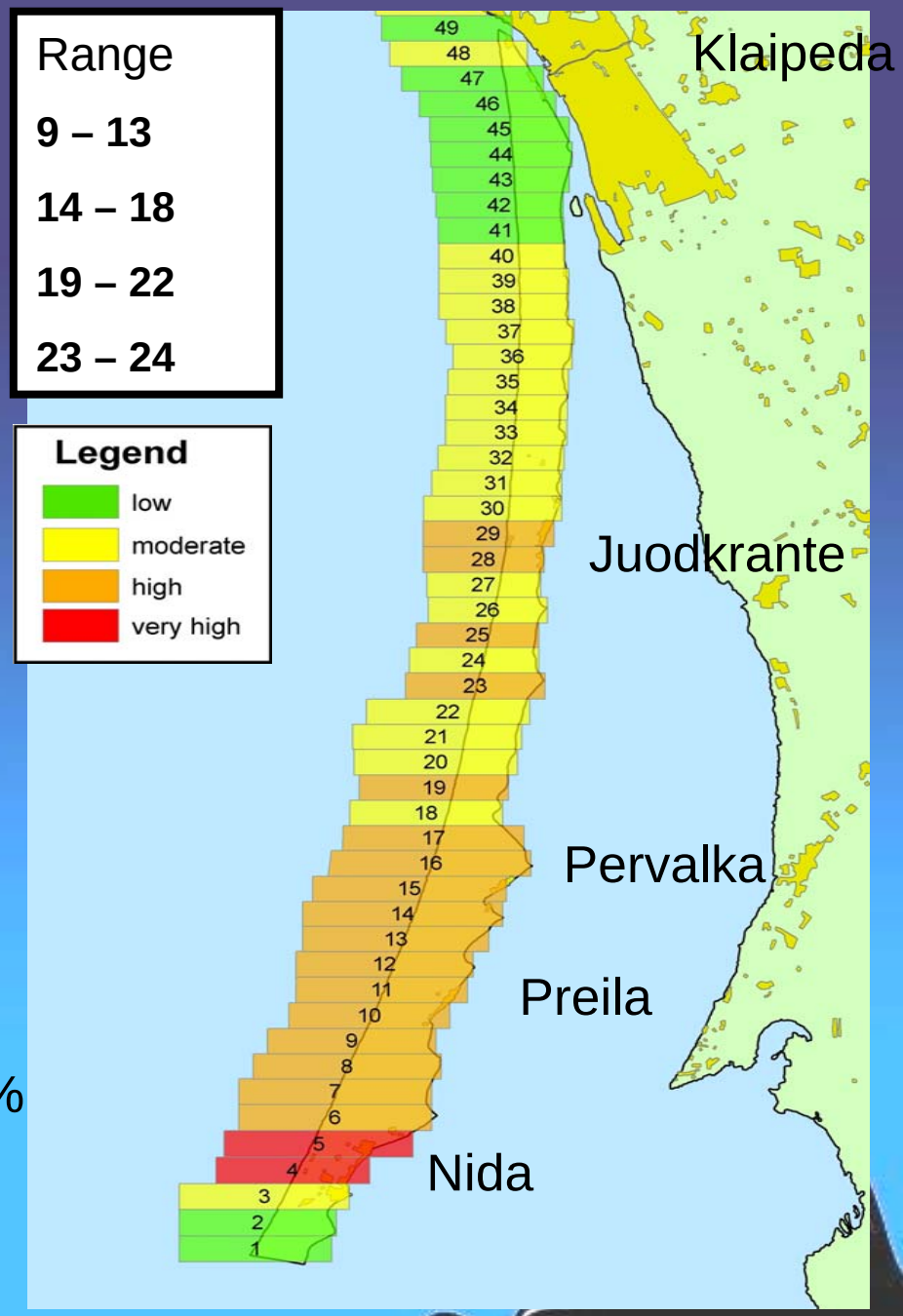
•Areas of priority: Coastal area north of Nida need the highest efforts to be protected:

Relative contribution of investigated features (& services) to sensitivity:

- biological resources (esp. birds) – 53%
- recreational importance – 23%
- value as management area – 19%
- commercial important fishery areas – 6%

↑

$ or €



Prestige Oil Spill, November 2002

An attempt at containment…

Soldiers cleaning the beaches

The oil reaches the coast.

Clean-up costs
Ca 2,5 billion €

Locals used to harvest clams from this beach.

However, not only clean-up costs ....

- **Around 30,000 people in the fishery and shellfish sectors have been directly affected**
- **80 percent drop of normal catch**
- **Contaminants on the sea bed can enter the food chain**

•According to a WWF report, damage to fishing and related economic sectors, tourism and the natural heritage along 3,000 km of coastline polluted by the spill may last for over a decade and cost approximately € 5 billion, with society at large paying 97,5 % of it. (*

Insurance pays max. 175 Million **€ …**

Solution for Problems – 3:

3. Cost-benefit analysis

(of different Ecosystem Management states)

Private benefits <-> public costs

$4000

Value
(per hectare)

Private Net Present Value per hectare

1989

Mangrove: $1,000 to $3,600

Shrimp Farm: $25,000 to $200

900

Less subsidies (-$1,700)

Timber and Non timber products ($90)

Mangrove Conversion (Honduras)

Pollution Costs (-$230)

Restoration (-$8,240)

0

Mangrove

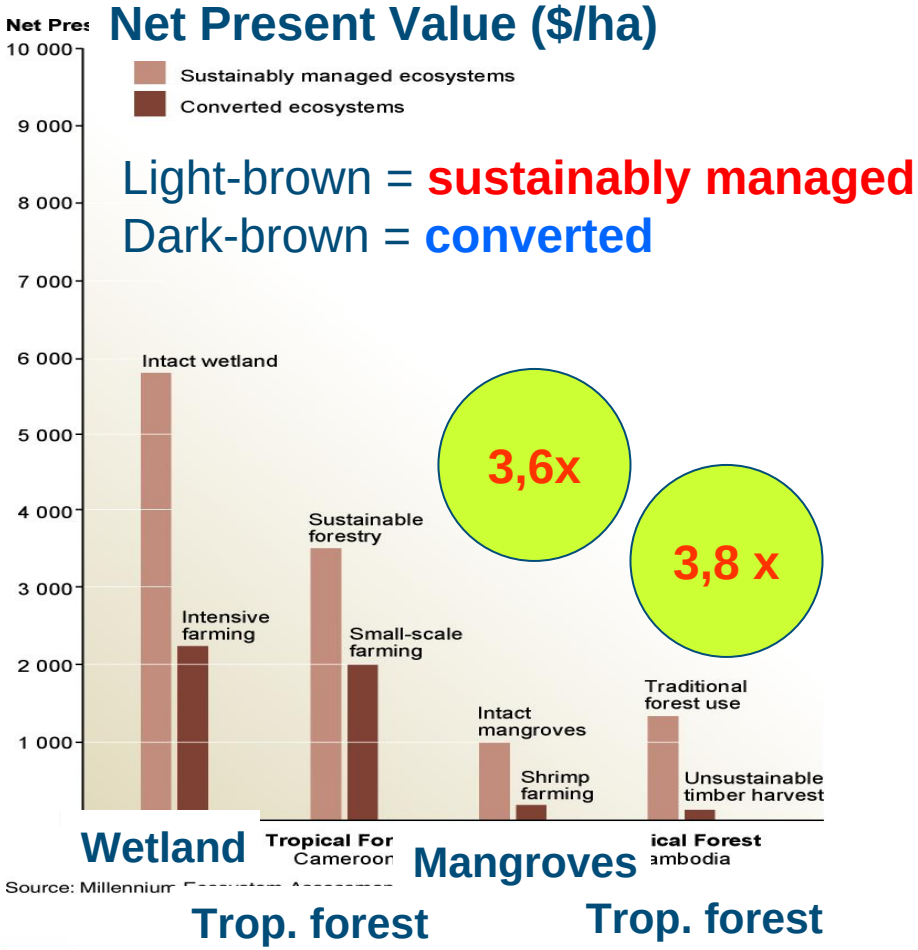
Shri arm

Source: Millennium Ecosystem Assessment; Sathirathai and Barbier 2001

The **total economic value** of managing ecosystems more sustainably is often higher than the value associated with conversion

Balmford et al (2002, Science Vol 297)
„Economic reasons for conserving wild nature“

Globally, habitat loss is costing at least 250 billion US$/year



*„ ...evidence accumulates that natural habitats generate **economic benefits** which exceed those obtained from habitat conversion;*
*... the overall **benefit – cost ratio** of an effective global program for the conservation of the remaining wild nature is **at least 100:1** „*

“Problems that need a solution” *(among others ..*

1. How to map / visualise ecosystem services ?

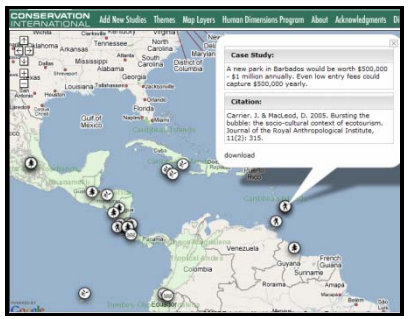
2. How to better represent Ecosystem Services in Decision/ Planning Support Tools ?

3. How to turn value into real money ?
   (for sustainable use and restoration of Ecosystem Services)

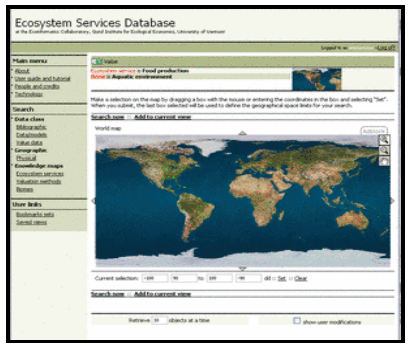
“Putting Ecosystem Services on the Map”

Conservation International

- EcoServices Mapping



Ecosystem Services Data base (UVM) + NV&F-Case Base (WUR)



Ramsar Data base Wetlands International

“Digital or Virtual Earth Project” Conservation commons Initiative (www.conservationcommons.org) IUCN Canada + WCMC-UK + CI + Microsoft

Similar ideas: WWF-USA & RSPB-UK & IUCN-NC
(+ use Google Earth)

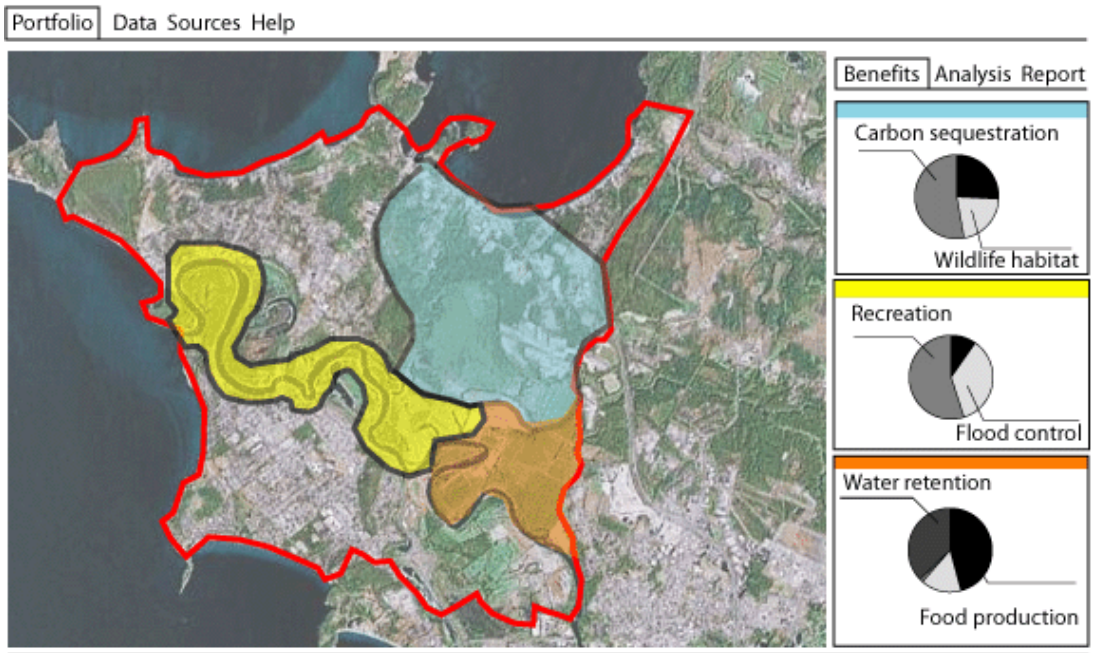
IUCN Commission on Ecosystem Management
-> CEM workshop Barcelona (WCC Oct. 2008)
“Mapping & Visualising Ecosystem Services”

2. How to better represent Ecosystem Services in Decision/Planning Support Tools ?

ARIES **Assessment and Research Infrastructure for Ecosystem Services**
(NSF 925.000 US$ (2007-2010) Ferdinando Villa (IEE-UVM)

ARIES is a web-based technology for rapid ecosystem service assessment and valuation to make environmental decisions easier and more effective.
ARIES helps discover, understand, and quantify environmental assets and what factors influence their values, in a geographical area according to needs & priorities set by users.

What users can do with ARIES
ARIES can accommodate a range of different use **scenarios**, incl. spatial assessments and **economic valuations** of ecosystem services, optimization of **payment schemes** for ecosystem services, and **spatial policy planning**



Artificial Intelligence in ARIES
ARIES uses "intelligent" software agents to retrieve, analyze, and synthesize knowledge (prototype ready fall 2008)

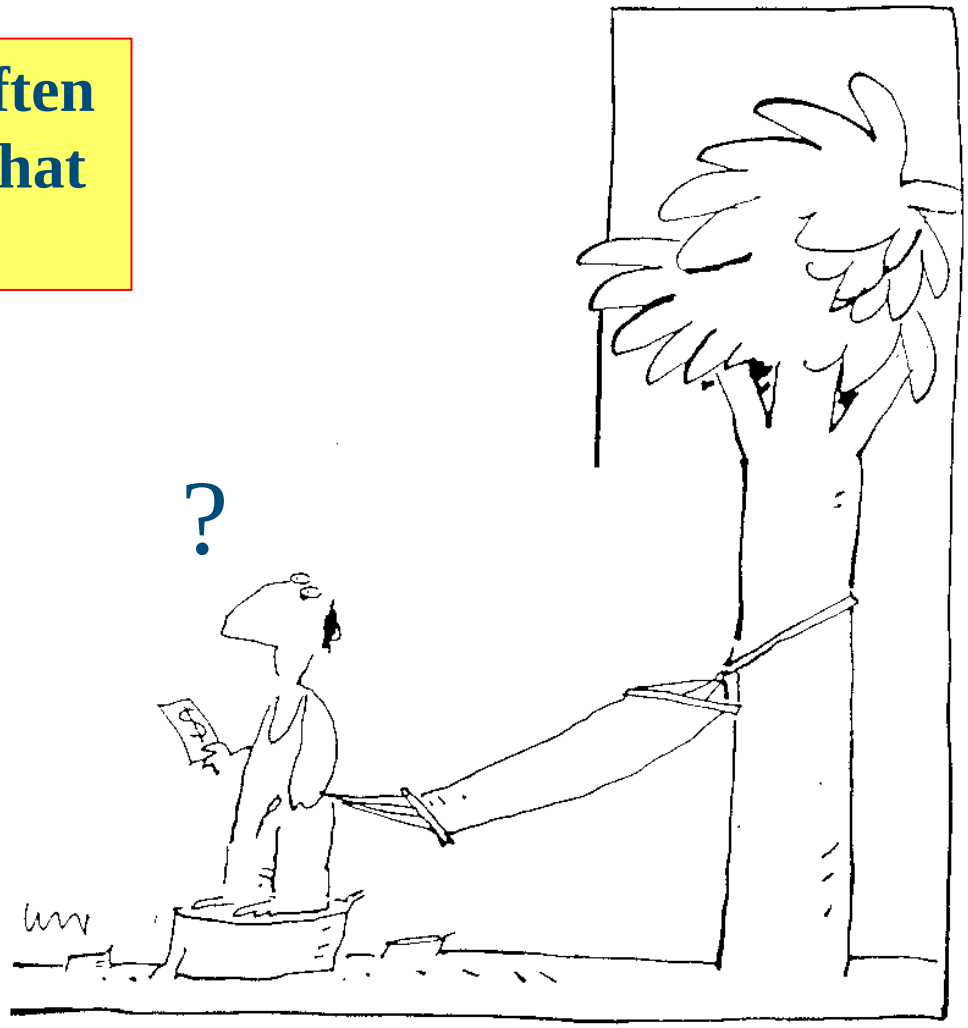
Current Partners include Conservation International, Earth Economics, and Wageningen University (ESA). Contact ecoinformatics@uvm.edu.

WAGENINGEN UNIVERSITY
WAGENINGEN UR

3. How to turn value into real money ?

(for sustainable use and restoration of Ecosystem Services)

True value (importance) often only becomes clear after what we valued is gone



Financing sustainabe use of ecosystem services

1) Direct payments

(User fees & Private deals)

- resources
- eco-tourism
- hydro-power companies
- pharmaceutical comp.

2) Ecolabelling (ecological (& social) pricing) – FSC, Fair Trade

(include value of ecosystem services in market prices)

3) Open trading („eco-assets“) – carbon credits, wetland banking

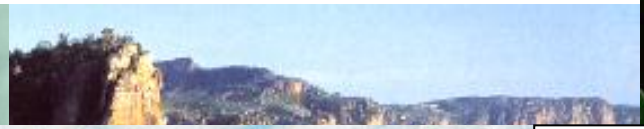
(average value of Carbon Credit: 800 US$/ha/y)[Ecosystem Marketplace]

4) Public Payment Schemes (subsidies) – e.g. agri-environmental measures, watershed protection *[NYC: Cattskil Mountains]*

5) Tax incentives – eg. lower taxes on Green Investment funds

6) Other: Donations (to NGO‘s), „Friend-schemes“, lotteries, etc

Investing in nature pays !



„Every dollar invested .... saves any-where between 7,5 and 200 US$ in damage & repair costs“
TheEconomist
(23 April 2005)

Awareness and communication **www.naturevaluation.org**

Nature Valuation Network - Microsoft Internet Explorer provided by the Environmental Sciences Group

File Edit View Favorites Tools Help

Back Search Favorites Media

Address http://topshare.wur.nl/naturevaluation Go Links

home | login | register

- About the Network
- Valuation Methods & Guidelines
- Financing ecosystem services
- Application of Valuation in Decision Making
- Ecosystem Management
- National Platforms
- Contact
- Latest
- Opp
- Wat
- Dat
- Pub
- Case
- Meeting
- Links
- Discussion Platform
- Partnerships
- Education
- Newsletter

Data bases

naturevaluation.org

Nature Valuation and Financing Network

The overall **aim** of the Network (NV&F) is to stimulate the development and exchange of practical tools for proper valuation of the goods and services provided by ecosystems, so that decisions concerning economic development are made with the full understanding of **all** the costs and benefits involved.
The site offers some interesting features such as a **publication database** which gives the users the opportunity to both download and upload information, **a case stud** to scroll through ongoing case studies, **discus** where users c **national platforms,** specifically

Methods

case studies

	ing Ecosystem Services	Application of Valuation in Decision Making	Ecosystem Management	National platforms





Latest News & Events:	Latest Publications & Case Studies:
Symposium: Nature Valuation and Financing - Making the priceless valuable. December 8, Ede (the Netherlands). For registration and the latest info click here	**New folder**. New searchable publication online! Please have a look. **RUPES programme**. A program to investigate reward schemes to upland poor in Asia. Have a look over here.

Supported by:

FSD IUCN The World Conservation Union

Project collaboration:

Water & Nature Initiative

Commission on Ecosystem Management

FOREST TRENDS

1) How to include scarcity (and change) into values / prices ?

- different discount rates over time and/or ecosystem ?
- *modeling* dynamics of ES (& their values)
- include uncertainty and risks / thresholds [indicators of scarcity?]

2) Value the Natural Capital (asset) versus the Services ?

- how aggregate (marginal) Flow-values to total Stock Value ?
  - choices re land use change influence total ecosystem not only (single/ multiple) service -> ecosystem prot./conversion/restoration.
  - up-scaling/down-scaling of point estimates *["Costanza-approach"]*
- *role of SPU ??*

3) Mapping ES values

- influence of spatial aspects on value
- & distributional aspects of choices (expressing value)
- \+ communicate ES ! Natural Capital Project [CI – IUCN]

4) How combine (monetary & non-monetary) values ?

- ecological – social/cultural – economic **+ monetary**
- How involve "stakeholders/beneficiaries" [CV <-> Group Valuation?]
- *MCDA* (combine MCA and CBA) [valuation <-> evaluation]

5) Need for protocols [ensure comparability *(&transparancy)*]

- not one answer/method – each valuation/DM situation "unique"
- But can indicate which valuation-method most suitable for which ES under which circumstances
- show options and consequences of choices re the DM-problem at hand
- *Need for data bases and better accessibility of case studies*

Several groups working on that:

eg. UK – UEA / CSERGE;

USA – Costanza (Ecosystem Service Partnership)

<-> Nature Valuation & Finance Network

\+ - Data availability / data bases ….

Additional issues ….

- Is there consensus on the concept of landscape functions and associated goods and services ? (and on the distinction between ecosystem & landscape services) ?
- which landscape functions (or services) are associated with a particular land cover or land use, and what is the influence of management ?
- what is the influence of the regional context on the valuation of landscape services and how can that be taken into account in a large heterogeneous domain (eg. Europe)?
- how can (all) stakeholders be identified who depend on, or benefit from the land use services at different scale-levels (local, regional, global) ?
- how can the benefits of land use services be valued by these stakeholders, especially taking account of the different scale-levels.
- which agents influence changes in land cover change and how can they be modeled to assess potential impacts of future changes ?
- how can landscape services, and their values be represented on maps ?
- how can we develop a network of consistent, representative case studies for analyzing the above questions in more depth and on longer time-scales ?

Theme 2: Values and Perceptions of Ecosystem and Landscape Services

Key questions:

- What are the most appropriate **economic and social valuation methods** for ecosystem and landscape services, including the **role and perceptions of stakeholders ?**
- How to make economic and social valuation of landscape and ecosystem services **consistent and comparable ?**
- How can **standardized indicators** (e.g. as in the "Kentallenboek") help to determine the value of E&LS and how can aggregation steps be dealt with?
- How can the **health benefits** of nature/green space in an urban residential context be quantified and assessed ?
- How can values be captured "**spatially**" (eg. through **mapping**) to address **scaling issues** and facilitate the use of E&LS in (spatial) landscape planning and decision-making ?
- What are the main bottlenecks in **data availability** and reliability and how can they be overcome ?

Theme 2: Values and Perceptions of Ecosystem and Landscape Services

Projects (co) funded by SELS:

- Aggregation of benefits (A. de Blaeij & M. vd Heide) MNP/WOt

Related projects

- Waarde groene kwaliteit voor bedrijven (Joke Luttik & P.Veer) MNP/WOt
- Nature benefits of Natura 2000 (M. v Wijk & W. Wamelink)
- De rol van groen in leefomgeving (Vreke) MNP/WOt
- Kosten-effectiviteit bodiv. In cultuurlandschappen (Schrijver) MNP/WOt
- Indicatoren natuur & landschap –beleving (de Vries) & betrokkenheid (de Bakker) MNP/WOt

Theme 3: Ecosystem and Landscape Services in Trade-off Analysis and Decision making

Key questions:

- How can information on E&LS be better included in **project evaluation methods** (such as EIA, CBA and MCA) ?
- How can the costs and benefits of changes in E&LS and values, in time and space, be taken into account, including **discounting** and **cost-effectiveness** issues ?
- How can analytical and participatory methods be combined to enable effective **participatory policy and decision making** dialogues ? [MCDA, RITA, ARIES] ?
- How to **select and involve stakeholders** in trade-off analysis and what conditions make knowledge about E&LS applicable ?
- How to **communicate and visualise** knowledge about ecosystem and landscape services and values, and the relevant uncertainties, to the various stakeholder groups ? *[-> new Theme 6]*

Theme 3: Ecosystem and Landscape Services in Trade-off Analysis and Decision making

Projects (co) funded by SELS:

- PhD: Effectiveness of climate adaptation strategies in coastal zones (& use in DSS tools such as MKBA**)** (J. Veraart)
- Cost – benefit analysis of [adapting to] climate change: coping with risk, uncertainties & preference-changes (R. Jongeneel & K. v Koote MNP/WOt
- Linking social, economic and ecological systems in the countryside: landscape management and design for building rural resilience (W.Heijman, P. Opdam, M. vd Heide and vacancy)

Related projects:

- *Develop integrated cost - benefit analysis method (monetary and non monetary) ("MCDA") for changes in landscape functions and services* (Valentina Tassone/ *Dolf de Groot)*

Theme 4: Ecosystem and Landscape Services in Planning, Management and Design

Key questions:

- How can the concept of E&LS be applied to **target setting**, **design** and negotiation in spatial planning processes ?
- What planning and **design guidelines** need to be developed for green spaces in new urban residential areas to take the **health benefits** provided by E&LS into account ?
- How can **spatial indicators** and ecological cartography be used as analytic tools within the spatial planning context ?
- How can E&LS values be included in **stakeholder based analysis** and participatory decision making processes ?
- How can the concept of E&LS be better **communicated** to the relevant users ? *[-> Theme 6]*

Theme 4: Ecosystem and Landscape Services in Planning, Management and Design

Projects (co) funded by SELS:

- PhD Landscape services as a spatial planning concept
  (J. Termorshuizen)
- Ecosystem services of green – blue networks in participative landscape planning (W. Geertsema & E. Ste

MNP/WOt

Related projects:

- Optimizing multi-functional use of forests (P. vd Meer)

Theme 5: Financing Instruments for Sustainable Use of Landscape and Ecosystem Services

Key questions:

- **Which financing instruments** and requirements are needed to attract public and private investments in green quality ?
- What are the **transaction costs**? What costs should be included? Who should pay for these costs ?
- How to identify and quantify the costs and benefits of investments in E&LS, taking into account the **distribution of these costs and benefits** spatially and temporally, as well as among the various stakeholders ?
- How to structurally promote the **implementation of financing instruments** (for example by bringing together the supply and demand of services) ?
- How to **involve beneficiaries into payments** for ecosystem and landscape services ?

Theme 5: Financing Instruments for Sustainable Use of Landscape and Ecosystem Services

Projects (co) funded by SELS:

- PhD Institut. aspects of financing mechanisms (PES) (G. Meijerink) MNP/WOt
- How to pay ? (de Blaeij / Polman) MNP/WOt
- Rural European Platform and financing (H Diemont)
- Kosten-effectiviteit natuurplanner (J. v Raffe & M. v Wijk) MNP/WOt
- Marketing of non-marketed forest products and services (M. v. Wijk, M. vd Heide, G. Meijerink)

Related Projects

- Biorights financial systems for capturing PES in poor rural regions (H. Diemont)
- Funding for Nature and Landscape: Benchmarking (A. Gaaff and R. Smidt)
- Module natuurbeheer kosten (v. Wijk) MNP/WOt
- Investeren in Nationale Landschappen (Leneman) MNP/WOt

Theme 6: communicating & visualising ES

Key questions

- How can the concept of E&LS be better **communicated** to the general public, decision makers and relevant users ?
- How to communicate and **visualise** knowledge about ecosystem and landscape services and values (and uncertainties), to stakeholders ?
- How can standardized **indicators** (e.g. as in the "Kentallenboek") help to determine the value of E&LS ? + **perceptions** & involvement stakeholders
- How to structurally **promote** the implementation of financing instruments?/

Projects (co) funded by SELS:

- Development and refinement of **BelevingsGIS (Sjerp de Vries)** MNP/WOt
- European data base for **landscape preferences** MNP/WOt

  + website "daarmoetikzijn" (Martin Goossen, et al)
- Several elements in other projects

Integration:

- Pilot cases: NL "Groene Woud" & BR "Baviaanskloof" (SA)