

Ecosystem Services for Nature Based Solutions and Sustainable Financing of Ecosystem Conservation and Restoration

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Ecosystem Services

Biol.
control

Recreation

\$?

Habitat/
Support

C-seq

Pollination

\$?

\$?

Air quality

Timber

Priceless ?

Inspiration

Medicins
& models

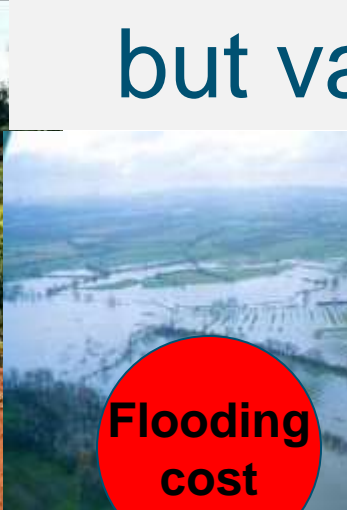
Food

\$?

Water

\$?

but valuable ?



**Flooding
cost**



**Lively-
Hood
loss**



**Water
pollution
cost**



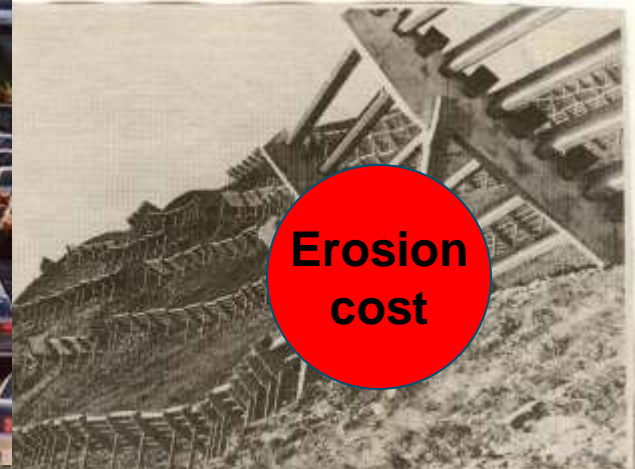
Cost of ecosystem loss 2-5% of GDP per year (*Science*, 2002)
(2-3 Trillion\$ damage-costs, replacement & restoration costs, etc.)



**Air
pollution
cost**

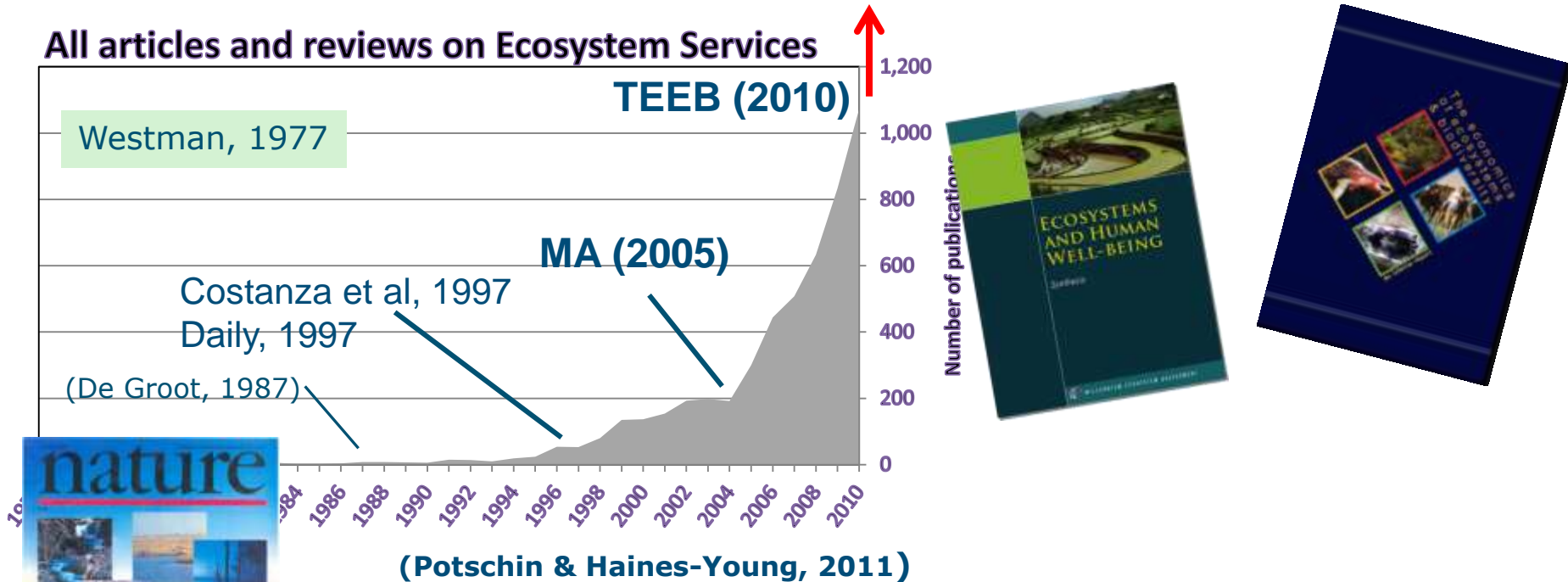


**Crop
loss**



**Erosion
cost**

Rapid increase in Ecosystem Service science and policy awareness



CBD, Nagoya, Oct 2010



Biodiversity, what is it worth to you?
[10 good reasons] ca 2:30 min

<http://vimeo.com/38736492>



Total Economic Value of Tropical Forest

6.000 US\$/ha/year

27%

66%

7%

Ecosystem Service	Direct Use Value #	Indirect Use Value #	Non-Use Value #
TOTAL: 5,935 US\$/ha/year (n = 132)	1,666 79	3,890 40	397 12
PROVISIONING SERVICES	1,285 59		
1 Food	67 21		
2 Water	143 3		
3 Raw materials	412 27		
4 Genetic resources	483 4		
5 Medicinal resources	181 4		
6 Ornamental resources			
REGULATING SERVICES		3,890 40	
7 Influence on air quality		230 2	
8 Climate regulation		2,191 11	
9 Moderation of extreme events		63 3	
10 Regulation of water flows		18 4	
11 Waste treatment / water purification		177 6	
12 Erosion prevention		694 9	
13 Maintenance of soil fertility		508 3	
14 Pollination		10 2	
15 Biological control		9 1	
HABITAT SERVICES			397 12
16 Lifecycle maintenance (esp. nursery service)			13 1
17 Maintenance of genetic diversity (gene pool prot.)			397 12
CULTURAL SERVICES	381 20		
18 Aesthetic information			
19 Opportunities for recreation and tourism	381 20		
20 Inspiration for culture, art and design			
21 Spiritual experience			
22 Information for cognitive development			

In ADDITION*
to intrinsic and
cultural values



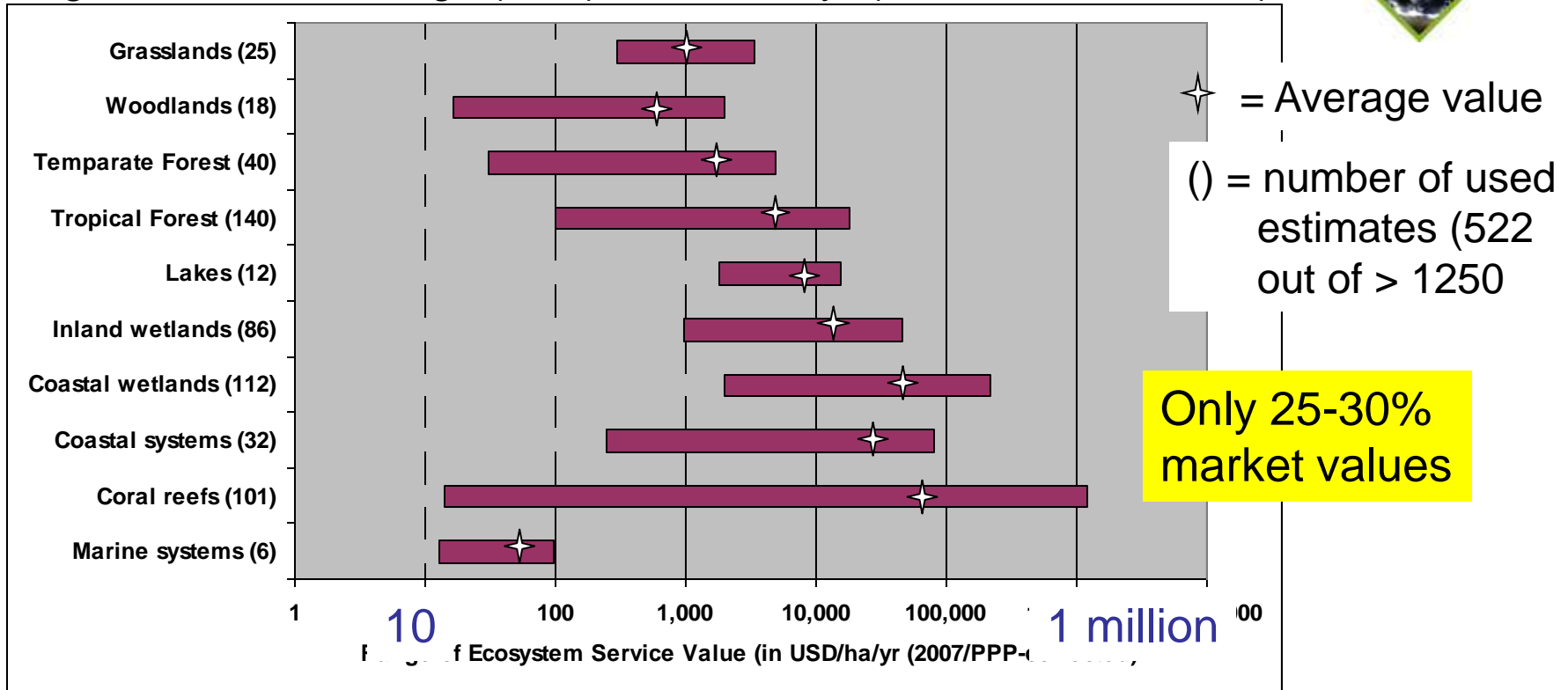
*) or not ...??

we are still cutting
& degrading tropical
forests and other
natural ecosystems
for short term
'economic' gains

The Economics of Ecosystems & Biodiversity



Log-scale of value range (TEV) in US\$/ha/yr (2007 PPP corrected)



De Groot, et al., 2012

Oceans

49 US\$/ha/yr [climate regulation & fishery]

Mangroves

46.239 US\$/ha/yr [waste treatment & nursery]

Coral Reefs

92.775 US\$/ha/yr [tourism & storm protection]

NATURA 2000 **COST** estimates

Building on the results of the Member States questionnaire, the **annual costs** of implementing the Natura 2000 network were estimated as **€5.8 billion** per year for the EU-27.
(Gantioler, 2010)

Average: 63€/ha/y (range: 10 – 800€/ha/y)
incl. acquisition & infrastructure dev. (30%) + management

Marine sites:
< 3 €/ha/y.



Question: is money spent on, eg employment a “cost”?

Natura 2000 BENEFITS

“A number of examples have demonstrated that the benefits can be **3–7 times** larger than the costs”

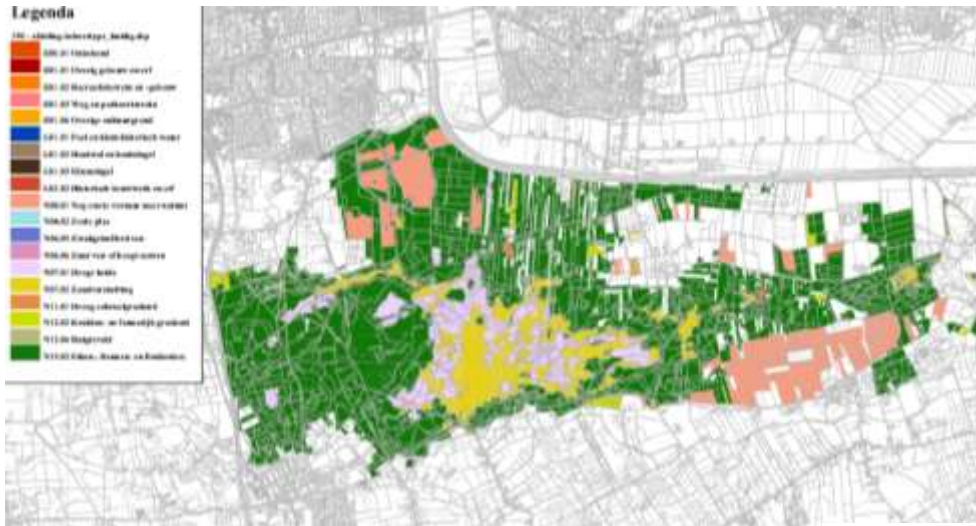


According to a study in Ireland, the aggregate benefits provided by the Burren park's limestone pavements and the orchid rich grasslands were estimated to amount to €4,420 / ha / year . The total benefit from the Park is estimated to be **€65 million** per year or about **3 times as much as the cost** of Government support (**Gantioler, 2010**)

The protection of all 300 Natura 2000 sites throughout Scotland was estimated to have an overall **benefit cost ratio of around 7** over a 25-year period (Jacobs, 2004). Total benefits were estimated at **£210 million per year**, however, 99% is non-use value (**Gantioler, 2010**)

In 2008 a study was carried out in France to determine costs and benefits of the Natura 2000 site 'Plaine de la Crau'. The calculated overall net benefits amounted to €142ha/year, which was **around seven times higher than the costs associated with the site**. (Hernandez & Sainteny, 2008).

De Loonse en Drunense Duinen (3500 ha) (The Netherlands)



100 x

Cost per ha: 142 euro/yr
Benefits per ha: 15.338 euro/yr

Important Ecosystem Services

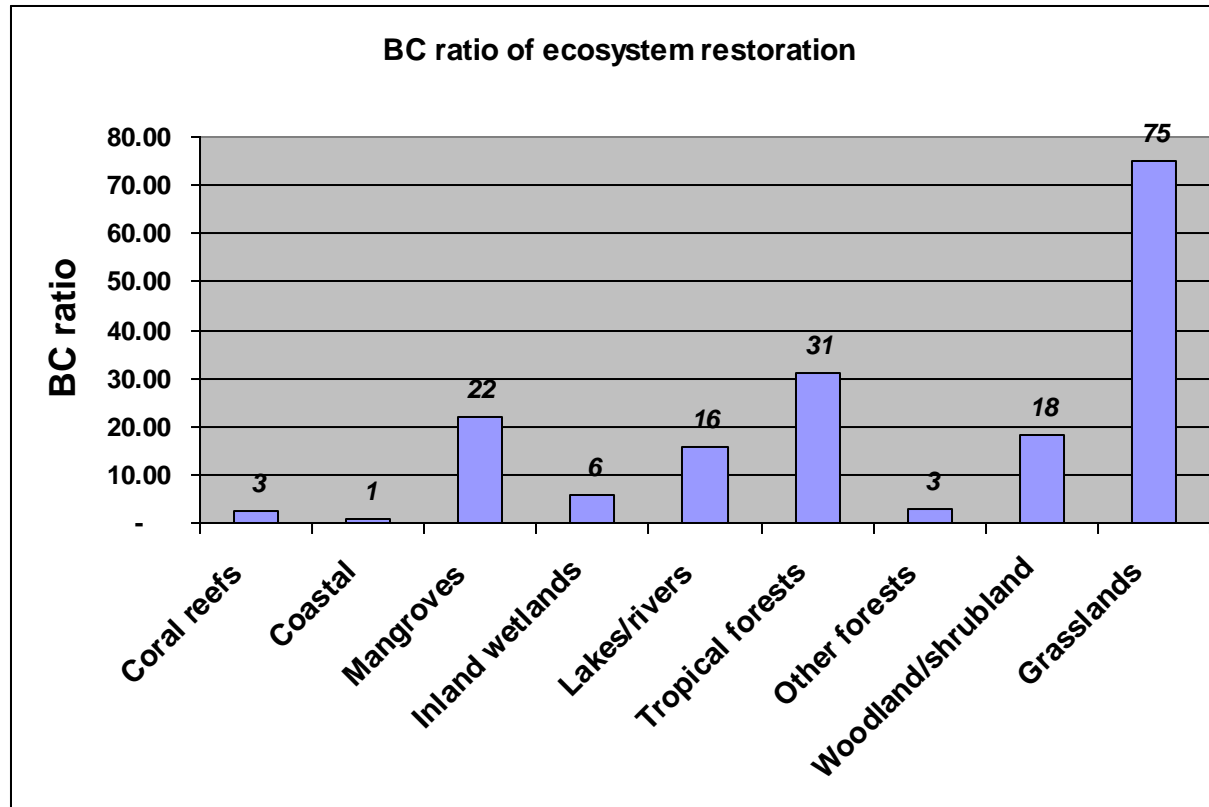
- Recreation
- Air filtration
- Real estate value increase
(proximity to Natura 2000)
- CO₂ sequestration
- Water-filtration



Benefits of Ecosystem Restoration

Blignaut et al. screened 20.000 publ.; 95 selected for further analysis *

Benefit – Cost Ratio of Ecosystem Restoration



Grasslands: 75 x



Coral reefs: 3 x

Assumptions: high cost scenario, average benefit scenario, time horizon = 40 years (including 10% annual operation costs; discount rate = 1 %)

Policy awareness greatly increased after 2010



CBD (2010): species loss
47.500/year (**1/11 min**)
Up from 27.000 in 2002 ...

EU Biodiversity Strategy
2020 (May 2011)
**“our life insurance,
our natural capital”**

-> Aichi Target 2

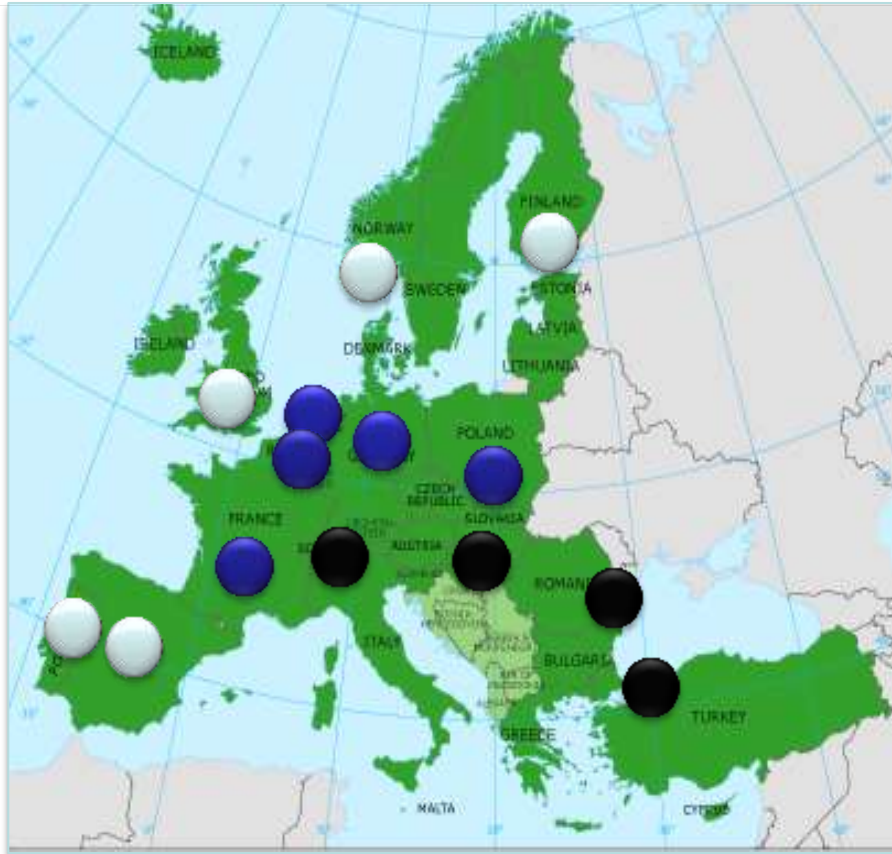
By 2020, at the latest, biodiversity
values have been **integrated into
national and local development and
poverty reduction strategies** and
planning processes and are being
incorporated into **national accounting**
..

Action 2: All member
states should have done a
**National TEEB study by
2014**





TEEB in Europe



STEPS:

1. Identify & Assess

- Indicators
- Mapping
- Quantification

< 2014: map & quantify

2. Estimate Values

- In physical units
- Monetary

< 2020: Valuation ready

3. Capture Values

- subsidies/taxes
- Payments for ES
- Policy change
- Institutional change

< ?? : Instit. change ?

The Economics of Ecosystems & Biodiversity



- Reward/Pay providers of “free services”
- “Punish” environmental damage (liability)

1. Government run finance mechan. (public incentives: subsidies/taxes)

- Agri-environmental schemes [“farming for nature”]
- Conservation payments (e.g. watershed-prot. [NYC]
REDD+ (forests->blue C. & restoration)
- Other (eg. tax-incentives for green investments)



2. Government supported market creation

- Offsets, eg **Carbon credits** [145 billion\$ 2009/800 US\$/ha/y – Ecosystem Market Pl
- Other “eco-assets” (eg. salinity credits, wetland banking, high-rise buildings(!))

3. Private market arrangements [**PES** – payment for use of ES]

- User fees (eg. resources (water), eco-tourism, bioprospecting)
- Biorights (compensate local people for *not* damaging ES, i.e cons.easem/Perrier)
- Ecolabelling: Cert.Agr.Products (40 billion \$ 2008/2,5% of total market)
FSC: 5 billion, Fair Trade, etc)

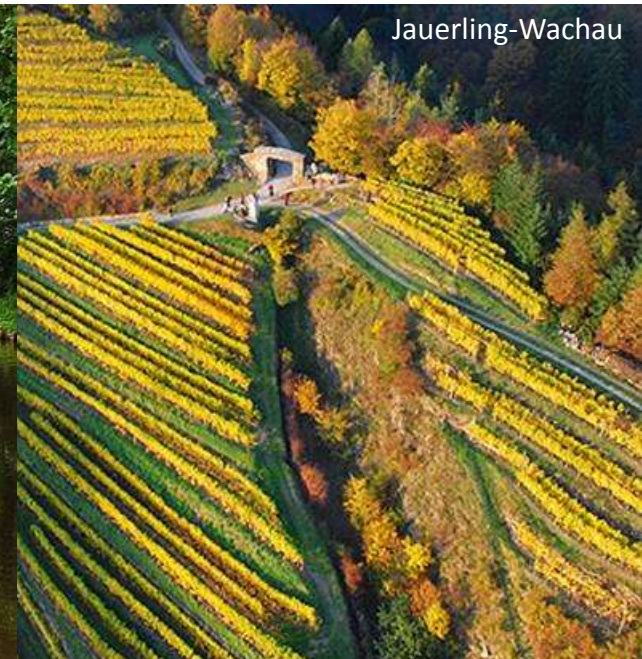
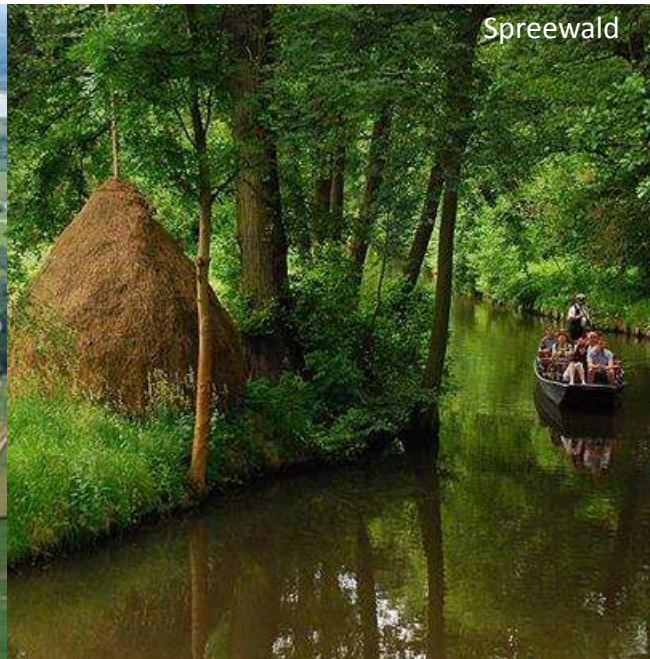




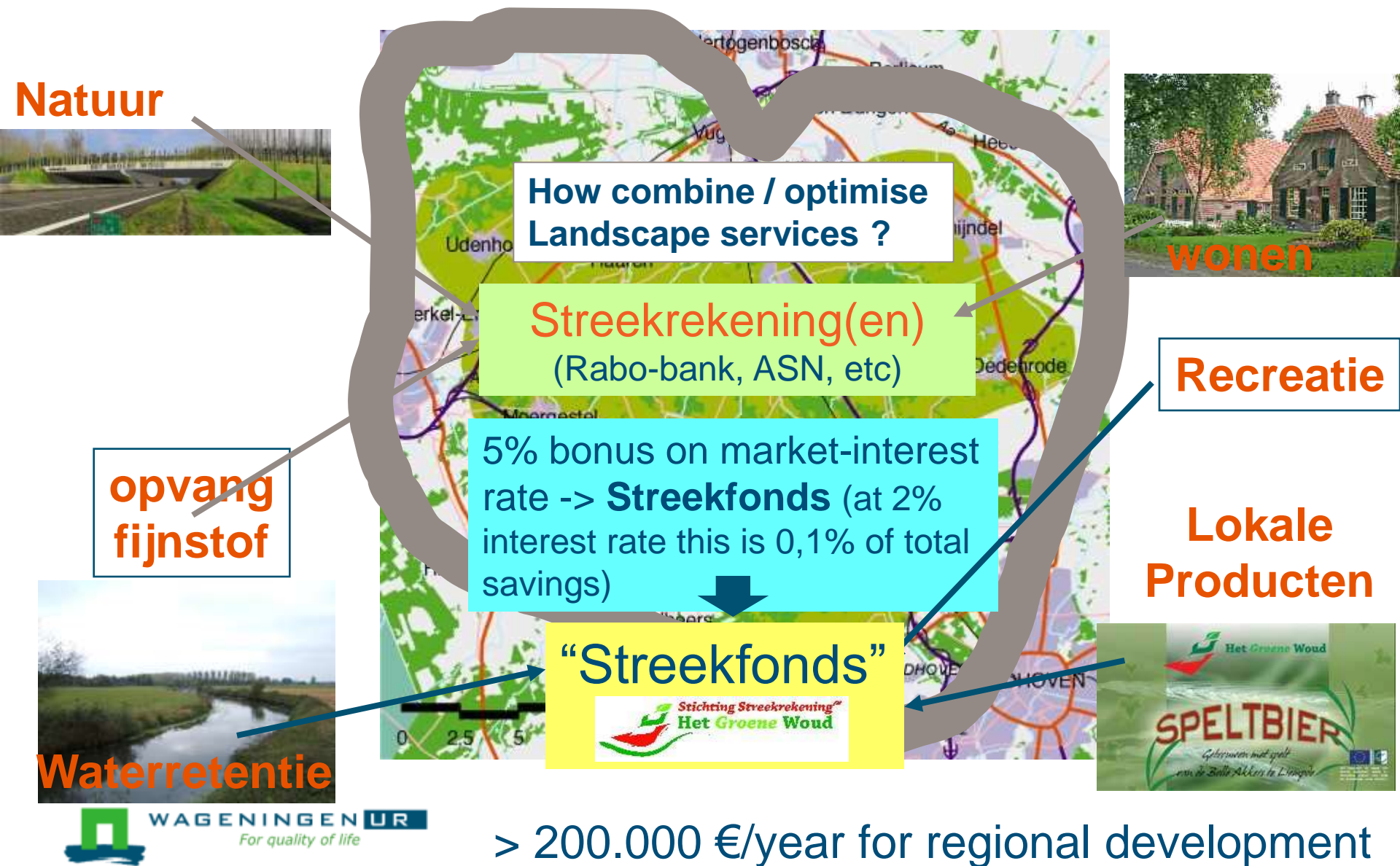
Civil-Public-Private-Partnerships [cp³]

Collaborative governance approaches for policy innovation to enhance biodiversity and ecosystem services delivery in agricultural landscapes

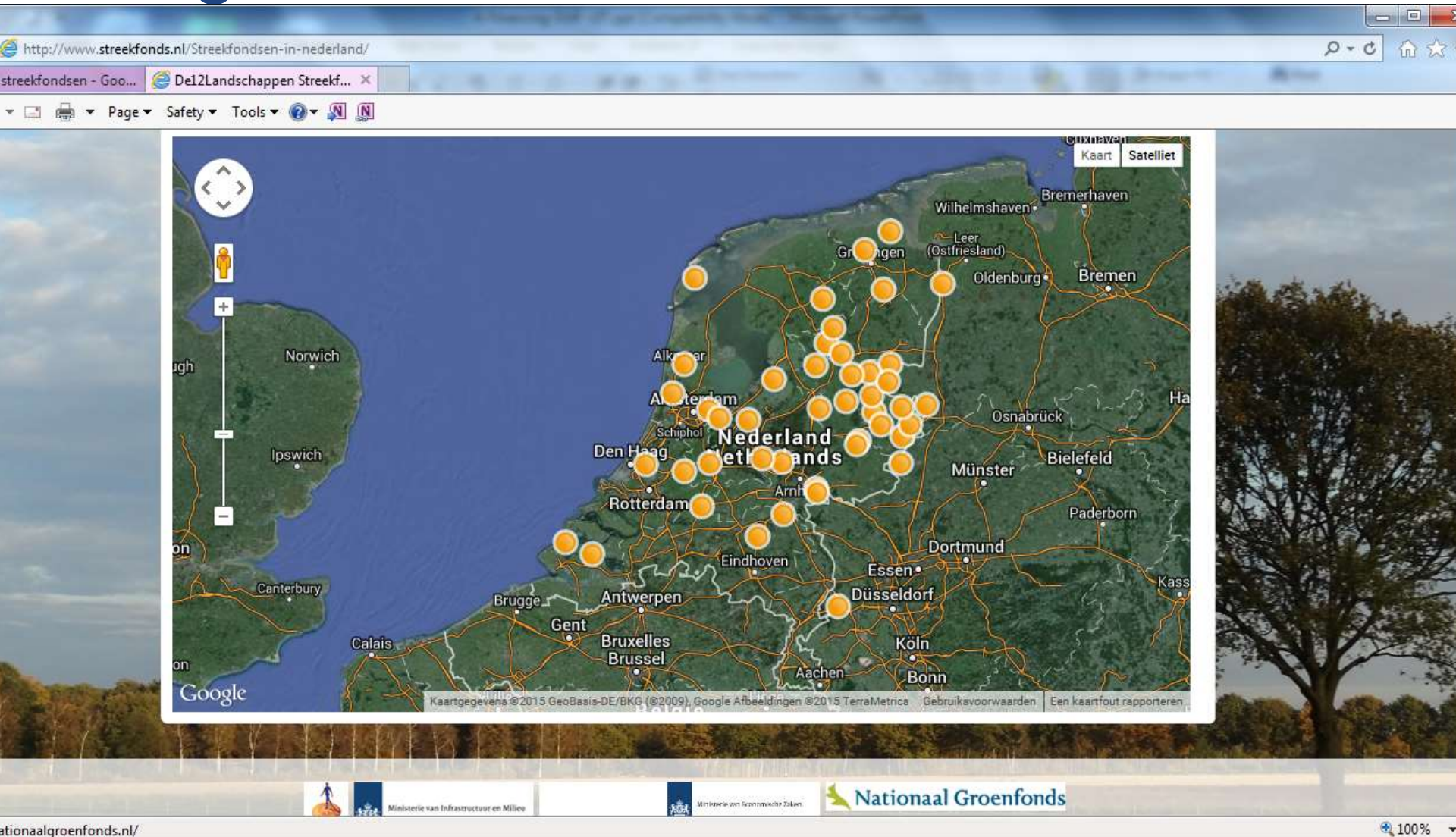
Kick-off Meeting May 27-28, 2015 Berlin



National landscape 'Groene Woud' : PPP-example



Regional Funds in the Netherlands



Supported by: RaboBank, Min. of Infrastructure, Min. of Economic Affairs, National Greenfund (a.o. lotteries & donations)

Innovative instruments: eg. Landscape Auctions

Landschapsveilingen (TripleE)



“For Sale”

10 year lease-contract ...

26.000 € for a small lake
140.000 € various landscape elements
in Ooijpolder

- 100 m hedgerow
- a bench or historic tree
- free view
- etc

Public Financing: agri-environmental schemes

Paying farmers to restore/enhance env. quality and provide additional services (landscape-quality, recreation, biodiversity, etc)



4 types of services

- Landscape
- Nature & environment
- Cultural History
- Education & access

Points for degree of Service provision

Each point is 10 €
⇒ **5.812,50 €**
(example)

Source: "Landscapefund"

- a) **Public money**
(subsidies, taxes, etc)
- b) **Private money**
(products, sponsoring, etc)



Maatregelen voor de natuur en het landschap

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REP is the network for effective and innovative solutions by creating the right conditions for **financing sustainable rural development** through co-operation between the public and the private sector.

What does REP do?

- REP is managing and clustering **regional projects** that are congruent with the REP philosophy, e.g. on
 - regional marketing and supply chains,
 - integrating farming and nature conservation,
 - novel public-private partnerships for financing;
- REP is the facilitator of choice for high level policy makers:
 - knowledge transfer between grassroots experience and policy making,
 - policy roundtables on sustainable rural development;



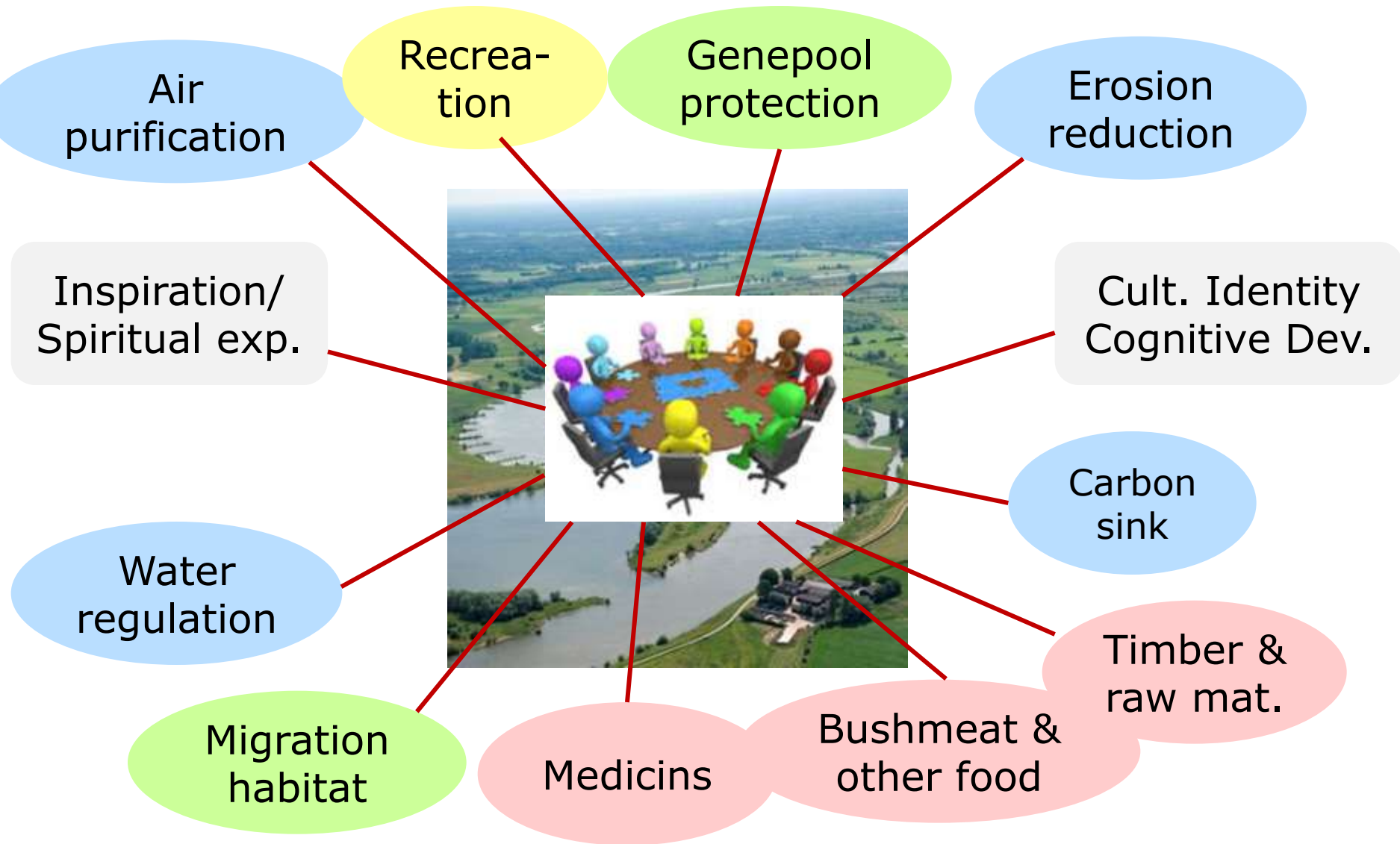
Natural Capital Declaration (2012)



WBCSD: “..work together
to establish a harmonised way to
measure and value nature in business”

<http://www.naturalcapitalcoalition.org/>

Valuation & visualisation of trade-offs brings people together



Whole (eco)system analysis



> [Homepage](#)

Home
About the Partnership
Become a member
ESP Services
ESP Working groups
ESP Conferences
Journals
News
ES Newsletters
Upcoming events
Vacancies
Links
Contact and Support

ESP Services

- Networking & Outreach
- Case studies & Showcases
- Data & Knowledge sharing
- New Publications
- Training and Education
- Guidelines & Toolkits
- Funding/Cooperation calls
- Young ES Specialists

- Contact
- Support & FAQ
- Members & Partners
- Steering Committee

Become a Member

ESP Activities and Networks

Thematic Working Groups	Biome Expert Groups	Sectoral Working Groups	National ESP Networks
13	10	5	> 50