



**‘World Café’ report**

**Daily’s framework on ES**

**GLUES Synthesis Workshop**

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**Berlin (Hotel Abion)**

**Alt-Moabit 99, 10559 Berlin, Germany**

## Ecosystems

Most groups started with the discussion of what an ecosystem is and how it is defined or perceived by regional projects. It was suggested that ecosystem can be defined in terms of:

1. **Place (biotope)** – a geographical area with all abiotic and other environmental conditions
2. **Processes (fluxes)** – fluxes of energy, matter and biological information
3. **Structure (environmental gradients)** – composition and configuration of ecosystem components

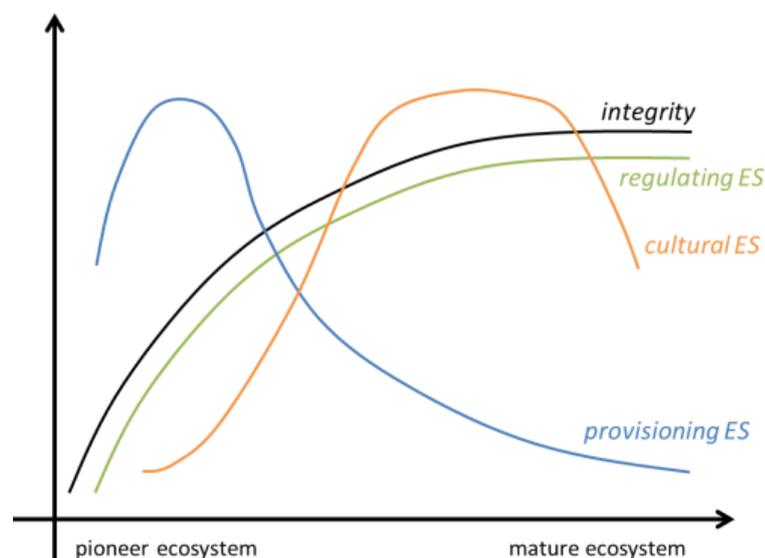
Several groups noted that definition of ecosystem **boundaries and scales** at which ecosystems will be studied is a crucial but complicated problem. Scale can refer either to **“extent”**, i.e. the geographical area that is considered in the analysis or to **“grain”**, i.e. the resolution or a detail of variables that are measured. Participants suggested various criteria that can be used to define the boundaries and appropriate scale of ecosystems: land cover, vegetation, climate factors, land use intensity, landscape connectivity, the process that is studied, ecosystem resilience and thresholds, focal species and their dispersal abilities, given research question.

Further discussion pertained to the specific ecosystem components that can be measured and quantified. We agreed that these components can be divided into **“stocks”** or **“assets”** that change over time and due to fluxes in space and time define ecosystem **“functions”**. As main ecosystem stocks (assets) quantified by regional projects we listed: carbon, water, nutrients, pollutants, species, energy and radiation. As main ecosystem functions we listed: storage and retention (of carbon, water, etc.), productivity and turnover, richness (e.g. species richness).

One point emphasized was whether humans should be explicitly seen as a part of an ecosystem or an external entity. Some projects perceive **integration of humans** as necessary because human land use is an internal part that defines ecosystems (e.g. the case of rice dominated agro-ecosystem). Other projects perceive humans more as an external entity, causing disturbance and ecosystem change.

The debate also stirred towards the **relationship between species richness/diversity** as one character of ecosystems **and delivery of ecosystem services**. Similarly as mentioned e.g. in de Groot et al. (2010), we concluded that the relationship will be highly variable based on the type of ES considered. **Provisioning ES** often do not require high biodiversity, rather specific selection of species (e.g. crops, cattle, medical plant species, etc.). **Regulating and supporting ES** may depend on much higher numbers of species, providing complex network of ecological relationships. Degraded ecosystems with higher intensity of use are believed to have decreased regulating ES. **Cultural ES** will vary: higher biodiversity is needed if a pristine ecosystem is valued; mid-range diversity preferred if the European type of cultural landscape is valued; specific selection of species required if rare, “cute”, flag, or sacred species are valued.

In this context, Felix Müller introduced the concept of **“ecosystem integrity”** and its relationship to different types of ES. The concept can be illustrated as:



To elaborate on the link between ecosystems and ecosystem services, we discussed the differences in definitions of **ecosystem functions and ecosystem services**. The major point was that function does not imply any value, whereas service is dependent on a value or a demand. Therefore, there can be cases when function (e.g. water retention) is equal to a service but becomes a service only when there is a demand for it. Similarly, ES research is driven by a specific problem or a value and focuses on those functions that are relevant to this problem.

Finally, it was noted that there is a wide variety of **biophysical models** used to describe ecosystem functions but all should clearly state what their **limitations and assumptions** are. The **uncertainties** in the model and data should be acknowledged, both qualitatively and quantitatively.

## Ecosystem services

For a systematic, non-duplicative and consistent definition and classification of ES there is i) a template that helps to understand and articulate the “production chain” from ecological feature to human well-being (Young-Haines, Potschin 2009), ii) an ES definition approach that starts to identify final ecosystem goods and services (FEGS), as components of nature that are directly enjoyed, consumed, or used by a beneficiary (Boyd Banzhaf 2007) and iii) a list of ES categories provided by CICES that can be applied as a classification system (Young-Haines, Potschin 2010). The CICES categories should be used as umbrella terms, which will be specified by the analyzed ES of RP’s. The UK National Ecosystem Assessment (UK NEA 2011) and The South East Queensland (SEQ) Ecosystem Services Framework (Maynard et al. 2010) are good examples how to apply i) to iii).

To emphasise the mechanisms that underpin the links between natural capital and human well-being it is important to distinguish between functions, ES and benefits. Interactions among and within natural elements (=functions) highly vary from biome to biome. A function to deliver a certain natural service or good exists independently of anyone’s wants and needs. To identify the link between ecological feature and ES, the demand side of human wellbeing needs to be captured. ES do not exist in isolation from people’s needs. Thus, ES only becomes relevant if a beneficiary can be clearly identified. Benefits are the welfare gains ES generate and can also defined as the thing directly consumed or used by a beneficiary. To emphasize the difference between ES and benefits, ES should be seen as ecological inputs into a production function (e.g. markets), while benefits are the outputs.

During the World Café rounds the idea came up to use the “production chain” as a concept of analysis, i.e. develop a matrix with functions, ES, benefits and values as a common basis of RP’s for the assessment of ecological feature and how they contribute to human wellbeing. In some cases this would be an over-simplification of the real world, because processes are mostly not linear, not static and not selective. Nevertheless, it does provide an analytic overview that can be used to be aware of the different elements that have to be taken into account and for a comparison between different RP’s.

Deliberately keep degrees of freedom in ES assessments, as an adaptive strategy to be flexible and resilient enough, that following challenges can be addressed:

- a) impact of composition of stakeholder groups to identify benefits and values,
- b) prioritization of decisions of different stakeholder groups (e.g. different interests of beneficiaries for one ES), and
- c) objectives of ES assessment: optimizing a certain ES or multifunctional landscape

With (c) the basic question arises whether to do a problem driven investigation or full assessment? In the World Café we came to the answer, the ESC is a holistic framework, in particular address the analysis of trade-offs between all ES relevant for human wellbeing. However, there are still gaps in understanding and data availability of specific ES in certain regions, thus, the aim should be an analysis as complete as possible with remarks to knowledge gaps.

Paper ideas:

- influence of land-use change of “bigger RP’s” on climate change
- How to upscale from RP to global scale – common methods
- Effects of changing landscape structure on ES
- Cross project analysis on ES scale dependence

**Literature**

Boyd, J.W., Banzhaf, S., 2007. What are ecosystem services? The need for standardized environmental accounting units. *Ecological Economics* 63, 616–626.

Haines-Young, R.H. and Potschin, M.B. (2009): Methodologies for defining and assessing ecosystem services. Final Report, JNCC, Project Code C08-0170-0062, 69 pp.

Haines-Young, R.H. and Potschin, M.B. (2010): Proposal for a Common International Classification of Ecosystem Goods and Services (CICES) for Integrated Environmental and Economic Accounting (V1). Report to the EEA, Contract No: No. EEA/BSS/07/007, 30pp.

Maynard, S., James, D., Davidson, A., 2010. The development of an ecosystem services framework for South East Queensland. *Environmental Management* 45, 881–895.

UK National Ecosystem Assessment (2011) The UK National Ecosystem Assessment: Synthesis of the Key Findings. UNEP-WCMC, Cambridge.

Selection of case studies (out of 365 isi-web of science listed publications) that include all of the below mentioned criteria for their assessment of ES.

- process based approach,
- consider interdependences between ES,
- stakeholder engaged,
- uncertainties mentioned,
- consideration of scenarios.

Author	Year	Titel	Journal	Countries	ES
Knoche S. et al.	2007	Valuing deer hunting ecosystem services from farm landscapes	<i>Ecological economics</i> [0921-8009] Knoche yr:2007 vol:64 iss:2 pg:313 -320	Michigan Southern Lower Peninsula, USA	Food, tourism
Alcamo J. et al.	2005	Changes in nature's balance sheet: Model-based estimates of future worldwide ecosystem services	<i>Ecology and society</i> [1708-3087] Alcamo yr:2005 vol:10 iss:2	Global	Food, fresh water, raw material, climate regulation, soil retention
Peterson G.-D. et al.	2003	Assessing future ecosystem services a case study of the Northern Highlands Lake District, Wisconsin	<i>Conservation ecology</i> [1195-5449] Peterson yr:2003 vol:7 iss:3	Northern Highlands Lake District (USA)	Food, Water quality, biological regulation, Tourism
Schroter D. et al.	2005	Ecosystem service supply and vulnerability to global change in Europe	<i>Science</i> [0036-8075] Schroter yr:2005 vol:310 iss:5752 pg:1333 -1337	EU15, plus Norway & Suisse	Food, fresh water, raw material, climate regulation
Yates D. et al.	2005	WEAP21 - A demand-, priority-, and preference-driven water planning model Part 2: Aiding freshwater ecosystem service evaluation	<i>Water international</i> [0250-8060] Yates yr:2005 vol:30 iss:4 pg:501 -512	Battle Creek River, Cow Creek River (USA)	Water quantity, water quality

## Values

In the first three discussion rounds the key issues related to the values of ecosystem services were identified. The participants identified the most important **types of values** that are addressed in the projects: cultural value, existence/intrinsic value, option and bequest value, and monetary value. **The questions of why and for whom these values are of importance, how these can be assessed and prioritized and how values can be used for informing land use decisions have been discussed.**

It was noted that there might be important ecosystem functions and services, which are not recognized by stakeholders and will only be valued when they degrade or lost. Therefore, a prioritization will have to involve a diverse source of information combining stakeholder knowledge and expert knowledge. In particular it was noted that qualitative and quantitative information needs to be combined for assessing the importance of the different values and for informing policy options. Multi Criteria Analysis was named as a possible method for this.

While in some projects the stakeholders specifically asked for monetary valuation of ecosystem services it is of minor concern in other projects, where the cultural values related to ecosystems and land use dominate. In some projects it was not sure whether information on ecosystem service values would be at all of relevance for stakeholders. It was in particular asked for guidance on methods and resources for multi criteria analysis and economic valuation of biodiversity and ecosystem services and some possible sources were mentioned (see further details below).

The investigation of the different values of ecosystem services for the different stakeholders was seen as useful for analyzing the current land use system, identifying trade-offs and synergies in land use decisions and assessing alternative land use options. Monetary valuation was seen as useful for: providing information on trade-offs between private and public benefits from ecosystem services; comparing the costs and benefits of different land use options and their socio-economic consequences (winners and losers); for informing instruments such as compensation payments, payments for ecosystem services; and for accessing new markets such as the carbon market.

In this context it was also noted that access and property rights are of importance when assessing values and how proposed land use options might impact those rights and the socio-economic consequences this can have. In this context conflict of interests between different stakeholder were discussed, in particular between national and local interests for development.

Furthermore, it was noted that values change over time and that the dynamics in space and time have to be recognized when assessing and proposing options on land management and policies.

How to develop specific indicators for ecosystem services and their values was discussed but no clear answer could be reached, mainly due to difficulties in separating ecosystem functions and services. It was noted that the concept of ecosystem services is context specific and stakeholders can have different views on what are ecosystem functions and services, depending on which ecosystem services they depend on and benefit from, at which level they are (local, national, ...), and which cultural background they have. Therefore, it is crucial to focus on the specific issue/problem/policy question that is the target of the assessment when developing indicators and determining qualitative and quantitative values for ecosystem services. In this context the issue of uncertainty was discussed, highlighting that the assessment design is important for reducing uncertainty, that uncertainties need to be communicated and that the different values need to be integrated in decision processes.

### Further sources on the value of biodiversity and ecosystem service

- **TEEB Ecological and Economic Foundations (2010)** is a comprehensive book providing the scientific background on this topic for researchers and practitioners involved in the design of assessments: <http://www.teebweb.org/EcologicalandEconomicFoundations/tabid/1018/Default.aspx>

- **The TEEB Quick Guide (2010)** provides a brief overview (8 pages) on the use of economic valuation in local assessments:  
<http://www.teebweb.org/Portals/25/Documents/TEEB%20for%20Local%20and%20Regional%20Policy/TEEB%20Loc%20Pol%20QG%20English.pdf>
- The report **TEEB for Local and Regional Policy Makers (2010)** provides an overview for local decision makers on opportunities and methods for using valuation at the local level:  
<http://www.teebweb.org/ForLocalandRegionalPolicy/LocalandRegionalPolicyMakersChapterDrafts/tabid/29433/Default.aspx>
- The **Millennium Ecosystem Assessment Manual for Assessment Practitioners (2010)** is an excellent source of information concerning the design of the assessment in general: <http://www.unep-wcmc.org/medialibrary/2010/10/31/90af3045/EcosystemsHumanWellbeing.pdf>
- The **Introductory guide for valuing ecosystem services (2010)** by Defra provides useful information on economic valuation and multi criteria analysis:  
<http://archive.defra.gov.uk/environment/policy/natural-environ/documents/eco-valuing.pdf>  
More detailed information on ecosystem service valuation is available at:  
<http://www.defra.gov.uk/environment/natural/ecosystems-services/valuing-ecosystem-services/>
- **Case studies** are available at:  
**TEEBcases:** <http://www.teebweb.org/TEEBcases/tabid/29858/Default.aspx>  
**Defra:** <http://www.defra.gov.uk/environment/natural/ecosystems-services/research-and-case-studies/>

## Institutions

At this workshop station two main issues were discussed: first, the definition of „institutions“ and, second, possible means and incentives how to influence institutions.

### *Definition of „institutions“*

The regional projects were asked how they define „institutions“ in their projects and what institutions they analyze. It turned out that the projects concentrate on different kinds of institutions and that at the moment there is no common definition of „institutions“ within the group of regional projects.

In the discussion the following terms were differentiated:

- Stakeholders („Akteure“), incorporating different levels of scale, different sectors, decision structures and cultures, and
- Systems of rules („Regelwerke“), including social, cultural, informal, formal and legal rules

As a definition of „institutions“ was suggested: implemented rules, regulations and incentive mechanisms.

Especially noted in this context was the discrepancy between the definition of „institutions“ within the social sciences and what the projects (often / have to) analyze, i.e. „stakeholders“ (governance), which cannot easily be bridged.

Another issue pointed out was the influence of informal structures, violene or no go areas which sometimes are not easy measured and can hardly, if at all, voiced in discussions on the ground. Critical further cross-sector cooperations which often bear conflicts of interests.

### *Focal points of the discussion:*

- marked mechanisms -> who regulates the market? Market mechanisms often seem to be taken for granted and rarely analyzed from the point of view on how the situation on the ground might influence these mechanisms

- problem of different scales -> legislation as well as political and administrative bodies and other commercial stakeholders
- organizations -> NGOs but also private sector organizations; specially breeders have huge influence in developing countries
- mixed section -> where rules doesn't have to be in place, but could be, e.g. property rights

#### *How to influence institutions*

Concerning how the institutions could be influenced, the projects suggested several concrete measures as starting points for change: planning concepts, input to development concepts, expert knowledge and knowledge exchange.

These information / innovation could be transferred through workshops and forums, capacity building, exhibitions, maps, films, differentiated communication with stakeholders, direct cooperation and media work.

Hereby, they might use their role as communication platform for information exchange and networking between the different involved stakeholders/institutions. Mentioned was also that the local universities function as „door openers“, though the decisions are drawn elsewhere.

However, several other possible obstacles have to be taken into consideration when working with different institutions, for instance local traditions, the time dimension and the stability, history and continuity of involved institutions as well as personal connections, which sometimes are more important than official hierarchies. Therefore it seemed to be reasonable to investigate in the communication and information flows at different scales and to adapt the ES concept to the local context as basis for discussion.

Since major push factors for landuse change were seen in the existing power structures and legislation it seems to be a real challenge to prepare information, ideas or concepts in that way that institutional change is possible.

## **Decisions**

Four aspects were discussed within the world café station “Decisions”:

main decision makers (link to “Institutions”)

kinds of decisions and key characteristics

Actions and Tools/Instruments (link to “Institutions”)

Indicators (link to “ Values” and “Ecosystem Services”)

Concerning main decision makers a wide range of institutions on different decision making levels was named ranging from local farmers to REDD and transnational bodies, but not in detail discussed (see pictures provided for both world café stations).

In the second cluster, “kinds of decision/key characteristics”, focal discussion points were water and land use questions, especially optimization of land use and land use decisions on different scales and conflicts arising from cattle farming as traditional land use. Other prominent issues were deforestation, land use conservation conflicts and lower intensive agriculture. On a general level also the question, what kind of decisions are analyzed by the projects was pointed out.

Within the third cluster „Actions/Tools/Instruments“ a huge palette of actual, planned or possible contributions of the regional projects was collected. As most important were marked stakeholder workshops and DSS, followed by technology transfer and visualization. Other actions could be state of the art-reports, manuals, train the trainer, awareness building, concrete policy recommendations, cost-benefit-analyses and so forth (see pictures for more information).

Finally, it was agreed that there is a general difference between assessable and non-assessable indicators and that there is no need for extra indicators within the section „Decisions“.

*Further overarching observations*

Generally, the topic “Decisions” (plus Ecosystem Services) seemed rather diffuse on top of what has been discussed in the stations before. Further, the distinction between what is happening on the ground and the projects’ contribution to the topic “Decisions” was often seen difficult to assess. Here, one could also ask to what kinds of decisions the projects contribute. Two issues in this respect:

- an orientation of the project/s towards “solutions” will bring more into focus “actions”, which is linked to the choice of key characteristics for decisions
- a majority of the regional projects seem to work on a analyzing/descriptive level with sometimes little orientation towards concrete goals or implementation; one exception here is for instance the project INNOVATE whose goal is working towards a “green liver”.

So, on an analytical level it seems important to be aware of what is happening on the ground and what is the project’s contribution within the given setting as this has significant implications for the decisions within the project and on its actions.