



Szent István University
Doctoral School of Environmental Sciences

COMMUNITY-BASED SOCIAL VALUATION OF ECOSYSTEM
SERVICES: AN ECOLOGICAL ECONOMICS APPROACH

Theses of Doctoral (PhD) Dissertation

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Gödöllő

2013

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Doctoral School of Environmental Sciences

Discipline: Environmental sciences

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1. Background

In spite of having a relatively short history, the concept of ecosystem services has rapidly attracted wide-scale policy interest and generated a large number of interdisciplinary research projects. Today, ecosystem services have found their place in public policy initiatives at global, regional and national scales – examples are the foundation of the Intergovernmental Platform for Biodiversity and Ecosystem Services (IPBES), the EU Biodiversity Strategy to 2020, or the ecosystem services assessments carried out at the national level (e.g. the UK national ecosystem assessment project). Due to the political embeddedness of the topic, different approaches to ecosystem services valuation have recently been placed at the top of the scientific agenda.

Today's dominant policy applications build on the results of monetary valuation which expresses the value of ecosystem services in a single metric (i.e. money flows) to make it comparable with economic performance. The majority of institutional incentives developed to foster the sustainable use of ecosystems build also on the economic value of ecosystem services (e.g. payments for ecosystem services (PES) schemes). Thus, it is not surprising that the liveliest scientific discussions focus on further potential improvements to quantitative and monetary valuation techniques. However, the reign of market-based approaches in ecosystem service valuation may generate new challenges: they may oversimplify the complexity and uncertainty of ecological systems and reduce the value of ecosystem services to actual or expected changes in individual or social utility (by excluding the moral aspects of value). Therefore the expansion of market logic to decisions about the natural environment may have negative consequences in the long run by maintaining unsustainable resource use patterns.

2. Objectives

Despite the above-mentioned hindrances I believe that the concept of ecosystem services can be used to initiate public dialogue about the importance of ecological processes, to communicate moral arguments and to foster community learning. However, this requires the implementation of alternative valuation approaches that break with the market-based tradition. I devoted my research to this idea, thus I formulated its general aim as follows:

*To create a **new theoretical and methodological approach** which helps the apperception of the essential role of ecological processes and the importance of the services they provide to local resource users, and which offers the opportunity to understand and influence the preferences and behaviour of local resource users.*

Five additional research objectives were defined to operationalise the general aim:

- to clarify the concept of ecosystem services from a social scientific approach and from the viewpoint of local resource users;
- to elaborate the underlying principles for methodological choices based on the theoretical standing of institutional ecological economics;
- to critically analyse the methods most frequently used for ecosystem services valuation;

them according to their value. Survey results were compared with those of focus groups to highlight the differences between group-based and individual ranking exercises. The scenario workshop was organised as a closing phase to discuss the future potentials of the area and to elaborate a commonly shared vision with local resource users, national park officials, experts and scientists.

Both case study sites are located in the Danube-Tisza Interfluve (Central Hungary). The first site – the Homokhátság – lies on one of the highest and driest areas of the sand ridge of the Interfluve and incorporates three settlements of the Homokhátság High Nature Value Area (Ágasegyháza, Fülöpháza, Orgovány). This site covers a very heterogenous landscape with lots of rare and endemic species. Natural habitats (dry grasslands and poplar-juniper forest patches) are mosaic with pastures, fragments of small- scale arable land, orchards, vineyards and expanding forest plantations. The second case study area – the Alpár-Bokros wetland – lies at the meeting point of the sand ridge and the Tisza-valley. It consists of two backwaters of the river Tisza, the surrounding wetlands and the eastern edge of the dry and sandy uplands around the settlements of Lakitelek and Tiszaalpár. Intensive agriculture (arable and row crop production, animal husbandry, orchards and vineyards) and forest plantations were typical in the area, but since 1998 the deeper lying parts of the site has undergone an ecological restoration project that aimed at reconstructing the valuable natural habitats and improving the flood protection service. Both sites are subjects of long-term ecological research and are protected by the Hungarian law. Significant portions of the research areas belong to the Kiskunság National Park and are leased and cultivated by local farmers, which causes tensions between nature conservation and agriculture at the local level.

4. Results

1) Based on two distinct theoretical approaches of institutional ecological economics I elaborated a complex set of criteria for assessing the expected impact and the appropriateness of valuation methodologies used for ecosystem services valuation.

I followed the theory of value-articulating institutions to discover and analyse the ontological, epistemological and methodological aspects of valuation methods that influence the results and the process of valuation by providing uniformed rules both for the researcher and participating evaluators. Based on this analysis I defined the following set of *impact assessment criteria* outlined below.

Criteria related to the ontological aspects of valuation:

- *The subject of valuation:* how does the methodology define the subject of valuation? Is it simplified or complex? Is it easy to understand and is the possibility of ignorance is acknowledged?
- *The definition of value:* how does the methodology define value? Does it reflect the changes in utility in a narrow or a broad sense (i.e. welfare or well-being)? Does it take into account moral aspects?

Criteria related to the epistemological aspects of valuation:

- *Expected role and rationality of the evaluators*: how does the methodology define the role of the evaluators: as consumers, citizens or stakeholders? Are the evaluators characterised by individual or collective rationality, or a context-dependent mixture of different rationalities?
- *Expected role of the researcher*: does the methodology place the researcher into the role of objective expert or leave some room for subjective value commitments? Does it place her into the role of facilitators?

Methodological aspects:

- *Relevant data*: what types of data count as relevant? Does the methodology work with numeric, objectivised data or is it able to handle arguments and moral judgments as well?
- *Data analysis*: which techniques are used for analysing the data and producing the results?

Based on the theory of institutional ecological economics I built a conceptual framework which placed ecosystem services at the border of the ecological and social systems to discover the methodological challenges stemming from their double (social and ecological) embeddedness. Based on this framework I elaborated the set of *eligibility criteria* which summarises the features of ecosystem services that require unique methodological solutions.

- *Complexity and uncertainty*: How does the methodology deal with the complexity and uncertainty of ecosystem services? Is it able to build these features into the process as inherent characteristics of ecosystem services?
- *Limited spatial and temporal substitutability*: Does the methodology handle the trade-offs between different services? Does it offer solutions to expand the results of valuation across time and space?
- *Limited market presence*: Does the methodology deal with the issue that some ecosystem services are already on the market, while others are public goods or common pool resources which are difficult to place into the market context?
- *Rationality contexts*: In case of ecosystem services stakeholders usually show a mixture of rationalities – they follow individual or social rationality according to the context of the decision to be taken. Does the methodology restrict the context to either individual or collective rationality, or is it able to handle the context- dependent nature of rationalities?
- *Incommensurability of values*: Is the methodology able to express the plurality of values attached to ecosystem services? Does it try to make commensurate the different value dimensions and if yes, how?
- *Social inequalities*: How does the methodology deal with social inequalities stemming from the trade-offs between services and the power asymmetries related to the right to access and use substantial ecosystem services? Is it able to level off the differences or does it generate new asymmetries?

Considering valuation methods along the impact and eligibility criteria sheds light on possible misfits between the special characteristics of ecosystem services and the key features of valuation methods, therefore it helps researchers to make a conscious methodological choice.

2) I elaborated a methodology for the community-based social valuation of ecosystem services and I empirically proved its applicability.

The community-based social valuation methodology of ecosystem services, developed in this research, combines qualitative social scientific and participatory research methods, and its underlying philosophy reflects the idea of deliberative democracy. The key characteristic of the methodology is twofold: it expresses the value of ecosystem services with arguments about their place-specific importance, and it generates an open dialogue among local stakeholders to discuss and elaborate community preferences together.

I identified three main advantages of the community-based social valuation methodology. It allows social learning by sharing the knowledge, opinions and feelings of different stakeholder groups and experts. It sheds light on latent resource use conflicts rooted in ecosystem services trade-offs, which is the first step to reconcile these conflicts. Thanks to its stakeholder perspective, it reflects the plural value approach of the community and does not restrict rationality either to its social or its individual form. Thus it helps understand the personal motivations behind valuation. A number of drawbacks were also made apparent. First, the methodology proved to be relatively time-intensive and costly. Second, the long-term commitment of key stakeholders and the continuous interaction between participants are prerequisites of social learning and for conflict management outcomes. These are difficult to achieve, especially if there is a low level of trust and a lack of prior deliberative culture within the community. Third, the personal engagement of the researcher may bias the results of the valuation, which demands persistent self-reflection. Empirical results also suggest that existing strong conflicts among stakeholders may distract from the valuation process and its original aims and thus limit its results, because stakeholders will focus more on the conflict than the subject of valuation. In these situations it is recommended that a conflict resolution process is launched before the valuation process starts.

3) I compiled a local inventory of ecosystem services for two Hungarian case study sites, which includes all locally relevant ecosystem services, their perceived local importance and temporal changes.

In the Homokhátság case study area provisioning services were highly appreciated by interviewees. Food and fodder production (especially grazing, vine, fruit arable crop production) was highly valued, as well as biomass production for building material and fuelwood. Genetic resources (especially old varieties and land races) were thought to be an important source of future adaptation to climate change. Water regulation and erosion control were named as the key regulating services, with both perceived to be deteriorating. A wide range of cultural services were listed in the interviews, e.g. the sense of place, the cultural heritage represented by the special settlement system (homesteads) adapted to local ecological circumstances, and emerging services such as environmental education and eco-tourism. No supporting services were addressed by the research participants.

In the Alpár-Bokros wetland area provisioning services gained a similarly high status. Food and fodder production, timber, ornamental resources and genetic resources were all mentioned, although the first two categories were perceived as the most important ones. Among regulating services flood protection and water regulation services were appreciated the most. Some interviewees also mentioned the local climate regulation effect of the river and its backwaters. Similarly to the Homokhátság case, a large number of cultural services were listed, e.g. sense of place, recreation, eco-tourism, environmental education, although different stakeholder groups had contradicting arguments about the local importance of these services. It was surprising – especially in the light of the Homokhátság results – that many interviews addressed supporting services provided by the regular floods (i.e. nutrient cycling and soil formation).

Comparing local knowledge and expert knowledge of ecological scientists, I found similar perceptions of the importance and ongoing changes of provisioning and cultural services. There is, however, a significant gap between local and expert knowledge in relation to regulating and supporting services: many of these services are perceived as very important by experts but hardly mentioned by local resource users. This suggests that there is a lack of consciousness about regulating and supporting services within the local community, which results in resource users being unable to judge the real importance of these services and fail to take them into account in their management decisions.

4) I analysed the local interpretations of the ecosystem services concept and I found that stakeholders consider ecosystem services taken-for-granted (i.e. obviously available) until they experience a significant deterioration either in their quantity or quality.

The empirical results suggest that local stakeholders do not consider consciously those ecosystem services which are easily available and have been relatively stable in the last decades. Local resource users are doubtful about their endangered status and it is difficult to motivate them to apply less intensive resource use practices to maintain the flows of these services (especially if they are interested in increasing the yields). However, the bigger deterioration is experienced in the quality or quantity of certain ecosystem services, the more consciously decisions are made to protect them. Scarce ecosystem services are increasingly considered to be the priceless gifts of nature – benefits which can be enjoyed free of charge if the ecosystem is healthy, and which cannot be replaced if the ecosystem is damaged. The protection of these services is discussed in the local community as an undoubted and necessary action because local stakeholders have already experienced the negative well-being effects of their deterioration. I called this typical local interpretation the *out-of-order approach to ecosystem services* to express that ecosystem services are “natural” in the anthropological sense as well: they are realised only when they disappear.

5) I critically analysed the interrelations between ecosystem services and human well-being, and identified some limitations of general theoretical frameworks to describe these relationships. I elaborated a less-structured framework which can be suited to local characteristics and allows for freer and more context-specific interpretations.

I found empirical evidence for three distinct well-being categories in the Hungarian socio-cultural context: material well-being (safe livelihood), social well-being (being appreciated and belonging to a community), and physical-spiritual well-being (personal integrity, i.e. enjoying physical, mental and psychological health). In each of the case study areas local stakeholders experienced the subjective decrease of well-being in all three dimensions in the last 30-40 years, which was partly traced back to the deterioration of ecosystem services. Perceived changes in ecosystem service flows and well-being dimensions are cyclic. The decline of ecosystem services first contributed to the worsening of material and social conditions. This led to changing land use patterns (more intensive land use by local resource users and increasing protection status by nature conservationists). As a consequence, the access to ecosystem services became limited (due to irreversible ecological changes and institutional restrictions), which again negatively affected the local well-being (now in each dimensions), urging further actions, and so on. However, it is important to note that the deterioration of well-being can be traced back to many external drivers beyond ecosystem services, e.g. to large scale social and political processes, to the unfavourable market context or to changes in individual life situations. Thus, the perception of well-being change is inherently subjective, the underlying reasons are person-bound, and it is not possible to clearly distinguish the factors that could influence individual well-being.

These empirical results suggest that there are no unequivocal and generalisable relationships between changes of ecosystem services and well-being; the links are rather context-dependent and inter-subjective. Those theoretical frameworks that describe these interrelations in detail (determining the direction and the intensity of links) are not applicable to many localities, because they cannot take into account context-specific and person-bound factors. Only some basic relations can be generalised, but these should be further specified in each new socio-ecological setting to adapt the framework to local circumstances. I identified four basic relationships based on empirical data analysis. Provisioning services are the source of material well-being and social appreciation (these two well-being dimensions are interrelated because material well-being helps to achieve and maintain a certain social status in our societies today). Cultural services contribute to all three well-being dimensions, e.g. sense of place is a source of identity and the feeling of belonging to a community, recreation, inspiration and information contributes to mental and psychic well-being (integrity), and eco-tourism can be a source of material well-being. Regulating services contribute to physical well-being. The majority of supporting and regulating ecosystem services is not directly linked to well-being dimensions but are mediated by provisioning and cultural services.

6) *I critically analysed whether the methodology of community-based social valuation is in line with dominant institutional logics and decision-making processes. I found that the advantages of the methodology can only be utilised if decision making processes undergo a deliberative turn.*

Empirical experiences reinforced that the results of community-based social valuation are difficult to channel into institutional processes in Hungary, because results building on the plural value approach of stakeholders and reflecting their sometimes contradicting arguments do not fit into the institutional logic of top-down decision-making. Reasons for this misfit are

manifold. First, the Hungarian nature conservation institutional system usually has to make decisions within very strict deadlines, thus it is not possible to carry out a valuation process which requires the commitment and active participation of stakeholders for several years, even if the process of valuation could enhance the legitimacy of the decision. Second, there is a lack of deliberative culture both within local communities and in the institutional system of nature conservation. The relationship of local stakeholders and national parks usually suffers from mistrust and prejudices. Although deliberation can be fostered through practice, this needs a continuous dialogue which involves participants as equal partners and which has practical relevance to them. The third difficulty stems from the rigidity of formal rules that determine land use patterns by influencing both farming and nature conservation decisions. One practical outcome of the community-based social valuation of ecosystem services could be a set of land use management suggestions that takes into account local ecological and social circumstances, but regulations that are centrally defined and implemented at the national level cannot be tailored to local specificities. Hence the outcomes of valuation cannot be institutionalised.

These limitations warn us that the full potential of community-based social valuation processes can only be exploited if the institutional logic opens up towards deliberation, and if the centralisation of land use decisions decreases. Once this deliberative turn is achieved, the methodology of community-based valuation can provide decision-makers with plausible arguments for nature protection and sustainable land use practices that are legitimate within the local community (because they are co-produced by stakeholders).

5. Conclusions and recommendations

- 1) The term and the scientific concept of ecosystem services are both inherently anthropocentric. If valuation processes seek to go beyond the measurement of the utility changes linked to ecosystem services and follows the original aim of raising public awareness and enhancing consciousness, non-monetary valuation methods are more suitable than the mainstream economic valuation approaches. However, the term and its Hungarian connotation may influence the process even if non-monetary methods are applied, and may restrict the outcomes to instrumental and utilitarian arguments. Therefore I suggest introducing other, less anthropocentric concepts (e.g. biodiversity) into the discussion if changing attitudes and behaviour is a core aim of the valuation process.
- 2) In order to make a sound and well-informed methodological choice for a valuation study, it is important to take into account the unique features of ecosystem services (the eligibility criteria elaborated in this thesis can be used as a supporting tool). Monetary valuation methods are adequate if the services under investigation are embedded into market processes, but non-monetary methods are suggested if moral or ecological reasons justify the protection of the targeted services. If the valuation process is complex, i.e. it covers a wide range of marketed and non-marketed ecosystem services, hybrid valuation methodologies which combine both monetary and non-monetary tools are the most appropriate.

- 3) The community-based social valuation process should be structured in a flexible way to be able to adapt to local social and ecological circumstances. If the local community is active and open, more emphasis should be placed on deliberative methods with groups, and the use of individual methods should be restricted to reaching the representatives of key stakeholder groups. If the community is rather closed, hierarchic or bounded by traditional forms of communication, individual methods have more of a place, and group-based methods should only be applied if there is mutual trust between stakeholders and researchers and if the used technique is adapted to local specificities. The balanced combination of individual- and group-based methods allows for the expression of local knowledge, opinion and feeling (through individual methods) and learning from each other and reaching a consensus (through group methods).
- 4) A key success factor of the community-based valuation is the long-term commitment and active participation of stakeholders. The personal motivation to participate can be improved and maintained if the valuation process addresses actual local problems and has clear and practical outcomes. One further necessity is that the process of valuation should reflect the values and interests of both the community and its individuals, which is possible if participants can act as stakeholders (instead of consumers or citizens) throughout the valuation process.
- 5) If there are latent conflicts within the community before the valuation process starts, the community-based valuation methodology can help discover and understand the roots of the conflicts. However, the original focus of ecosystem services valuation can be easily lost if the emphasis is put solely on the conflicting issues. In these situations I suggest to carry out a conflict resolution process before the valuation toolbox is applied. In delicate situations a separate mediation process involving the most conflictual stakeholder groups can also be powerful.
- 6) The validity and reliability of the results of community-based valuation can be enhanced if the continuous self-reflection of the researcher becomes an inherent part of the research agenda. It is also important to apply a critical approach to empirical data analysis. The key analytic steps are (i) the continuous cross-checking of data, (ii) the filtering out of contradictory and false arguments, and (iii) the systematic interpretative analysis of personal assumptions underlying contradictory or false arguments. This critical analytical approach allows an understanding of why and how obviously false arguments become part of the perceived reality individually or shared within a small closed group of people.
- 7) The methodology of community-based valuation allows non-professionals who do not have social scientific research expertise (e.g. students, natural scientists, land use planners, nature conservation professionals) to take an active part in some phases of data collection and analysis. Conducting semi-structured interviews and surveys, organising focus groups and scenario workshops and doing simple qualitative content analysis provides a good occasion to non-professionals to take the lead and initiate valuation processes on their own. In this case, however, it is very important to provide professional training and consultation to the evaluators in order to minimise frequent and fundamental

mistakes. Furthermore, the research process is longer because the first couple of interviews and sequences of data analysis may demonstrate an uneven quality, such that they belong to methodological preparation rather than to effective data collection and analysis. It is also important to note that the social intervention character of group-based methods (these may have an empowering effect but they can deepen existing conflicts and disappoint people if the setting and facilitation is not satisfactory) necessitates the collaboration of trained facilitators – these phases of the valuation process should always be led by professionals.

- 8) If the community-based social valuation process aims at changing the mental models, the level of consciousness and the behaviour of stakeholders at the local level, long-term commitment is required from stakeholders, decision-makers and the researcher. Intensive interaction should be maintained continuously and should include capacity-building to allow empowerment and the spread of deliberation techniques. This increases the costs and duration of the process, but may result in fundamental social changes and contribute to the shift to adaptive and participatory ecosystem management.
- 9) A science-policy interface should be established and maintained throughout the process of valuation to assure the practical relevance of the results and to be able to feed into decision-making processes. The acceptance of results can be enhanced if the philosophical and theoretical background of the methodology is clear and if procedures to increase the validity and reliability of results are transparent. However, the successful implementation of valuation results depends mainly on the institutional system's openness to deliberative decision-making.

6. List of Relevant Publications

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