

**SPECIAL SESSION:  
INSTITUTIONS AND POLICIES FOR ECOSYSTEM SERVICES  
IN EUROPE**

Session chairs: *Tatiana Kluvankova-Oravska, CETIP and CE SPECTRA* at the *Slovak University of Technology and Slovak Academy of Sciences* [tana@cetip.sk](mailto:tana@cetip.sk)

The importance of ecosystems support for sustainability and human well being has become common scientific knowledge decades ago. Actual approaches to conservation of natural resources targeting at habitat and species protection overlook ecosystem functioning and resilience of complex biophysical systems. Major gaps exist in addressing the importance of ecosystem services and their effects on well-being in related policies. The quality of these services results – among other things - from individuals' decisions and how they as well as from how decisions are regulated by norms and formal governance schemes, legislations, policies and various forms of economic incentives operating at and across the scale (Kluvankova-Oravska et al, 2012). As ecosystem services are primarily public or common goods, cooperative approaches to decision making under asymmetric and imperfect information are required thus reducing effectiveness of market instruments (Muradian, Rival, 2012). Understanding potential benefit from ecosystem services for effectiveness of biodiversity policies (Ring, Schröter-Schlaack, 2011) and shift from sectoral governance to ecosystem services governance and integrative policies (Primmer, Furman 2012) represent key challenge of this session.

The main focus of the session will be put on institutional innovations and decision-making approaches of the ecosystem services and navigation of behavioral change of ecosystems' users and managers towards sustainability under the conditions of multilevel governance and increasing pressure of global market.

The session will be organised as a **Discussion panel** and **Parallel thematic session**.

**References:**

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Muradian R, Rival L, 2012. Between markets and hierarchies: The challenge of governing ecosystem services *Ecosystem Services* 1 (2012) 93–100  
Primmer E, Furman E, 2012. Operationalising ecosystem service approaches for governance: Do measuring, mapping and valuing integrate sector-specific knowledge systems? *Ecosystem Services* 1 (2012) 85–92  
Ring I, Schröter –Schlaack C, 2011. Justifying and assessing policy mixes for biodiversity and ecosystem governance. In: Ring, I., Schröter-Schlaack, C. (Eds.), *Instrument Mixes for Biodiversity Policies*. Report No. 2. Helmholtz Centre for Environmental Research – UFZ, Leipzig, pp. 14–35. Available at /http://policymix.nina.no.

**DISCUSSION PANEL:**

The discussion panel will provide a platform for conceptual debate on modes of ecosystem service governance under the complexity and uncertainty, trade off between ecosystem services and effectiveness of related policies and positive incentives for behavioural change from European perspective. Panellists will have 7 minutes introductory talks followed by organised discussion along following topics:

- *How can the concept of ecosystem services be promoted in integrative policies to contribute to the wellbeing and sustainability?*
- *What innovative policies and decision making approaches can foster behavioral change to sustainable use of natural resources and promotion of ecosystem service concept?*

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*Irene Ring:* UFZ - Helmholtz Centre for Environmental Research, Germany

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**Abstracts:**

***Institutions and policies for ecosystem services in Europe (introduction)***

***Tatiana Kluvankova-Oravska***

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Actual approaches to conservation of natural resources targeting at habitat and species protection overlook ecosystem functioning and resilience of complex biophysical systems. Major gaps exist in addressing the importance of ecosystem services and their effects on well-being in related policies. The quality of these services results – among other things - from individuals' decisions and how they as well as from how decisions are regulated by norms and formal governance schemes, legislations, policies and various forms of economic incentives operating at and across the scale. Objective of the paper is to introduce key issues in ecosystem service governance further expanded in discussion session in particular (i) reasoning for shift from sectoral to ecosystem service governance, (ii) institutions for ecosystem service governance under the asymmetric and imperfect information and (iii) appropriate policy innovations to foster behavioral change. The main focus will be put on institutional innovations and decision-making approaches of the ecosystem services and navigation of behavioral change of ecosystems' users and managers towards sustainability under the conditions of multilevel governance and increasing pressure of global market.

***Modes of ecosystem service governance conditioning the operational applicability of research***

***Eeva Primmer***

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The concept of ecosystem services represents a science-driven approach that has gained political momentum. With a concept that is science driven, there is a risk of over-supply of knowledge from researchers to confused potential users.

Ecosystem service research tends to draw on large datasets, aim at spatially explicit analyses and eventually seek to integrate models of multiple ecosystem functions with knowledge about human behavior. Even though the approach is superficial as regards human behavior, there is interest in the drivers of ecosystem change and the gains and losses humans might experience with this change. The analyses promise an improved understanding of tradeoffs. Much of the ecosystem service research ambition lies with very large scale assessments and targets a global, a European or a national decision-making community. But for these decision-makers, ecosystem services and trade-offs are rather abstractions. The more local level analyses reflect better the real decision-making situations and address problems that are relevant for the decision-makers in the area.

To make an operational difference, also large scale ecosystem knowledge should be channeled to the practice and institutions governing ecosystem services in a

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meaningful fashion. Who governs ecosystems, how are they governed and how can governance be influenced? Who makes decisions, what drives and conditions the decisions and how are decisions iterated? The different governance modes of 1) hierarchical top-down implementation, 2) scientific-technical decision-making, 3) adaptive collaborative governance and 4) managing interest driven strategic behavior have been theorized and tested in natural resource management and nature conservation. The understanding of these modes should be extended across ecosystems and ecosystem services and tested also at high governance levels. This paper analyses the applicability of these governance modes to large scale ecosystem service research and assessments.

***Fiscal innovations for ecosystem governance in Europe***  
***Irene Ring***

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Good ecosystem governance includes the sustained provision of ecosystem services *and* the conservation and sustainable use of biodiversity. Looking at conservation and land-use policies through a governance lens reveals new perspectives for economic analysis in the field of public finance. Firstly, the analysis of governance structures focuses on the division of responsibilities between governmental levels. The assignment of public functions to the appropriate levels of government is a familiar topic in public finances, and fiscal instruments such as intergovernmental fiscal transfers are specifically designed to address mismatches between functions and financial resources available to fulfill these functions. The perspective missing in this respect is a more systematic treatment of ecological public functions and their integration into intergovernmental fiscal transfers. Secondly, governance structures are analysed with respect to responsibilities divided between public institutions, civil society and the private sector. Thus, ecosystem governance assumes a more comprehensive perspective and includes the interplay between the public and private sector, and between different actors.

Good ecosystem governance in Europe is closely linked to sustainable land use which in turn requires a variety of conservation efforts and ecosystem services to be sustained, not least at local and regional levels. Despite this, there are few incentives for local actors to engage in environmental and conservation activities when costs are borne predominantly at the local level, whereas ecological benefits cross local boundaries. In contrast to the vast literature available on compensation payments and PES for private land users, comparatively few publications exist with regard to local public actors. However, it is just as important to consider local governments, because they hold decision-making, financing and implementing competencies for a number of land use-related issues. Although these competencies differ from country to country in Europe, land-use planning competencies in particular along with the implementation of various land-related measures are often decentralised and entail considerable consequences for conservation outcomes and the sustained provision of ecosystem services.

In this context, the paper will explore the fiscal innovations required for good ecosystem governance in Europe. This involves a multi-level analysis starting from EU-level decision-making relevant to biodiversity and ecosystem

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governance over national to regional fiscal transfer systems addressing decentralized public actors. This also involves a multi-actor perspective, highlighting local public actors regarding their motivations and incentives for sustainable land-use practices, and the interplay between the public and the private sector for good ecosystem governance in Europe.

**Scope and limits of market-based instruments in ecosystem services governance.**

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The growing tendency to frame environmental problems as a failure to price non-market ecosystem services has coincided with the revival of monetary valuation and “market-based instruments” (MBIs) in the environmental science and policy agendas. Proponents of market-based instruments claim that, in comparison to traditional state-driven regulation, this new generation of policy instruments is more cost-effective, more capable to collect resources from the private sector, and more likely to create win-win solutions in pursuing goals of environmental conservation and poverty alleviation. Critical theorists, on the other hand, claim that MBIs can erode intrinsic motivations for conservation, contribute to the commodification of nature, and promote unequal access to land and resources. We draw on empirical case studies and institutional economic theory to examine the scope and limits of MBIs in ecosystem services governance. From our analysis we show that while the use of MBIs is likely to increase in the coming years, their scope of application to effectively address problems on the ground will be ultimately compromised by three major types of limitations: i) the non-fungible character of most ecosystem services complicates the definition of discrete tradable units, ii) the public good nature of most ecosystem services can involve high transaction costs for developing environmental markets, and iii) commodification of nature encounters wide societal contestation. We also note that responses to environmental problems that are traditionally framed in technical ways (e.g. need to correct the economic compass through monetary valuation and economic incentives) are in reality social dilemmas about the governance of the commons with fundamental political implications (e.g. where should the limits in the commodification of nature be set). We propose that, with rapid expansion in the implementation of MBIs there is a pressing need to deliberate on which ecosystem services fulfill the biophysical, institutional and ethical conditions to be governed by market instruments in an effective and legitimate way and which should be primarily governed by non-market institutions under logics of public policy and community-based regulation. We conclude by providing tentative criteria to define the scope and limits of markets in ecosystem services governance, including feasibility of technical substitutability and equivalence, transaction costs, basic needs, incommensurability, and environmental justice.

***THEMATIC PANEL:***

The thematic panel will concern 4 introductory papers presentations followed by the discussion to address common session challenges discussed in discussion panel.

**Ecological fiscal transfers in Portugal: Status quo and perspectives**

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Intergovernmental fiscal transfers redistribute public revenues from national and regional governments to local governments usually based on socioeconomic indicators such as population. Recently, ecological or conservation-based indicators have been introduced in intergovernmental fiscal transfers, under the designation of Ecological Fiscal Transfers (EFTs), to acknowledge the role of local public authorities in nature conservation. These schemes usually apply a quantitative criterion, such as surface of protected areas, as a proxy of the importance of the ecological functions provided by a given territory. With the 2007 amendment of the Portuguese Local Financing Law (LFL – Law 2/2007), Portugal became the first EU Member State to implement EFTs integrated in the annual transfers from the national to the local level (municipalities). The ecological criteria in play in this law are the total area under protection and the percentage of municipal land occupied by protected areas. An analysis of the ecological signal introduced in the Portuguese LFL shows that ecological transfers are very significant both in terms of total municipal fiscal transfers and ecological fiscal transfers received per hectare of Classified Areas (Santos et al, 2012). It discriminates positively municipalities with a high share of classified areas but the incentive still does not seem to compensate for the opportunity costs in some municipalities. Like other EFT schemes, the Portuguese law does not take into account the quality/ level of protection of different categories of protected areas, or the ecological goods and services provided by areas outside nature conservation networks. This is acceptable in a first stage of implementation, in order to avoid complexity and allow a progressive change in the mindset of decision-makers. However, this scheme can be improved to increase its effectiveness and performance regarding other relevant policy criteria (e.g. efficiency, equity). In this paper, we evaluate how relevant have these EFT been (could be) to change local public actors behaviour and compensate for opportunity costs, based on interviews to local public actors in municipalities in the southeast of Portugal. Alternative scenarios are tested to analyze the impact of introducing new ecological criteria for fund allocation, namely applying different indicators (such as provision of ecosystem services) or assigning different weights to the ecological component. Regardless the option used, it is critical that the selected indicator(s) are aligned with the conservation

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policy objectives and goals of the instrument, whether they are to compensate for opportunity/management costs or to acknowledge spillover benefits.

**Ecosystem Services in Urban Public Spaces as Commons. Challenges for Behavioral Change?**

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Concentration of economic activities and increase of urban population has rapidly influenced demand for urban ecosystem services. Urban systems represent complex, socio-biophysical systems interacting far away behind their administrative borders. Functional interactions and global partnerships are effecting their performance, in the same time strong interdependences of urban systems on local resources remains. This leads to the growing vulnerability of urban systems to external shocks, such as climate change effects, often appearing locally but affecting the whole system. While most of economic activities are individual and private, urban resources remains common pool resources, characterised by costly exclusion of beneficiaries through physical and institutional means and high subtractability of resource units available to others. Thus individuals jointly using (CPR) are assumed to face potential social dilemmas in which individual short-term interests are in conflict with long-term society interest. Urban commons are facing the problems of social dilemma typical to physical commons, where institutional maturity and behaviour of users significantly affect quality of public spaces, although absence of proper practice does not automatically imply into the resource depletion but rather deterioration of functions of urban public space. Vulnerability of ecosystem services in urban public spaces rapidly increased due to multilevel factor, in particular while ecosystem services are local, distant users operates across governance scale and with diverse interpersonal and social interest often ignoring sustainability and carrying capacity of local ecosystems. Furthermore, traditional governance modes based on territorial belonging challenges legitimacy of representative democracy resulting from the growing scale individualism of human existential space and overlapping action spaces of particular activities. In our paper we determine possible institutional novelties to address issue of the efficient management of ecosystem services in urban public spaces as common pool resources. In particular polycentric governance and spatial-structural polycentricism is considered to have high potential to address challenges of public open spaces sustainability and develop adaptive strategies to manage urban commons under the complexity. We will (i) identify key factors of urban ecosystem services vulnerability, (ii) potential of common pool resource regime and polycentric governance to innovate traditional spatial resource management, (iii) demonstrate it on success and failure examples from cross border and transnational cases.

**Behavioural change to sustainability of soil ecosystem services in Europe:  
Methods and analyses,**

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The key challenge of soil protection is to identify the most appropriate land management strategy in the face of agriculture driven land-use change. Traditionally soil socio-ecological systems (SES) such as pastures, forest land, conventional but also alternative crop systems represents local systems that have persisted for a long time adapting their rules in use to natural and social disturbances as well as to the broader economic, political and social systems in which they were embedded. Globalisation however introduces a dimension of scale which affects the vulnerability of traditional SES systems to external disturbances. In particular traditional (long lasting) institutions are challenged by global market actors and global policies, and their institutions that are not embedded in local institutional arenas. The market increases the vulnerability of SES as it demands the intense exploration of soil biodiversity ecosystem services. Within the EU 7 FMP Ecofinders we applied innovative methodological approaches (i) institutional analyses (SES framework and Multicriteria mapping) and (ii) behavioural experiments to address long term sustainability of soil ecosystem services in Europe in particularly when dealing with large scale governance systems and their interconnections within nested multilevel governance structures. At first SES framework was implemented as cross country comparison as well as numerous soil SES to identify alternative land use practices as key variables for soil ecosystem services preservation under the market pressure and multiple scale. Implementation of Soil directive across EU has been identified as key decision to incorporate sustainable soil use in Euro integrative policy and to address effectiveness of ecosystem services protection. Together 45 conventional and alternative farmers from 5 EU regions completed in depth-interviews that complemented data from Eurostat and analyses of EU soil policies. Multicriteria mapping, undertaken with 25 stakeholders has provided qualitative assessment of soil biodiversity indicators beyond cost-effectiveness. Each indicator was checked against a list of criteria to assess the indicators sustainability to represent the quality of soil biodiversity. The results were compared with the assessment undertaken by soil biodiversity experts and researchers. Effect of monetary incentives on behavior of users of ecosystem services has been tested by application of behavioral experiments. Key issue is financial incentive for sustainable use of soil ecosystem services as common pool resources under the asymmetric and imperfect information. Experiments conducted in lab (controlled conditions) determined other regarding preferences for sustainable behavior, the effect of communication on collective action and cooperation for the management of commons as well as 'crowding out' positive behavior if monetary incentive for sustainable behavior is terminated. Experiments were conducted using google drive platform with



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undergraduate students from universities in Slovakia and will be applied in field with farmers.

**Ecosystem services and climate change adaptation: Participatory scenario and modelling in diverse European landscapes**

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Social-ecological systems are facing an increasing burden of climate change impacts. The future state of ecosystem services is a complex outcome of current decisions and actions within the human society. The state of ecosystems is undoubtedly influenced by the economic return from the landscape. Investments into adaptation measures as a response to recent climate change have both ecological and economic implications. The predicted impacts of climate change are driving ecosystem use trade-offs and decisions on the sustainable management of ecosystems. Several European policies have been designed to stem the loss of vital ecosystem services and biodiversity or mitigate the impacts of climate change (EU Biodiversity Strategy, EU Strategy on Adaptation to Climate Change).

Ecosystem-based adaptation (EBA) has been proposed as a “natural” solution to adaptation to climate change. EBA is supposed to enhance the adaptation capacity of human society through the sustainable management and restoration of ecosystem services and provides multiple benefits to human society. However, the conversion and degradation of ecosystems have resulted in substantial decrease in the provision of ecosystem services worldwide and the importance of ecosystem service research for environmental decision-making has been widely recognised. However, application of policies for integrated governance of ecosystems still lags behind the EU-wide developments. Analysing the trade-offs among various ecosystem services helps to understand the full impact of landscape management, which is particularly important in valuable and vulnerable areas.

In our contribution, we present impacts of adaptation measures on ecosystem services and their perception by different stakeholder groups in selected case studies across the Czech Republic. The analysis is based on different scenarios of climate change and ecosystem services utilization in different landscapes (social-ecological systems): a city urban system, rural agricultural landscape, wetland biosphere reserve and a forested national park. We demonstrate different approaches to the analysis of social-ecological systems, including for example biophysical and economic modelling of ecosystem services using an InVEST modelling tool and participatory approaches to scenario development and cost-benefit analysis. We analyse future trade-offs in ecosystem services demand and the adaptation pathways which could lead to a sustainable use of ecosystems and integration of biodiversity and climate adaptation policies.