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The uptake of the ecosystem services concept in planning discourses of European and American cities

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ABSTRACT

Ecosystem services (ES) are gaining increasing attention as a promising concept to more actively consider and plan for the varied benefits of the urban environment. Yet, to have an impact on decision-making, the concept must spread from academia to practice. To understand how ES have been taken up in planning discourses we conducted a cross-case comparison of planning documents in Berlin, New York, Salzburg, Seattle and Stockholm. We found: (1) explicit references to the ES concept were primarily in documents from Stockholm and New York, two cities in countries that entered into ES discourses early. (2) Implicit references and thus potential linkages between the ES concept and planning discourses were found frequently among all cities, especially in Seattle. (3) The thematic scope, represented by 21 different ES, is comparably broad among the cases, while cultural services and habitat provision are most frequently emphasized. (4) High-level policies were shown to promote the adoption of the ES concept in planning. We find that the ES concept holds potential to strengthen a holistic consideration of urban nature and its benefits in planning. We also revealed potential for further development of ES approaches with regard to mitigation of environmental impacts and improving urban resilience.

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1. Introduction

Emerging from ecological economics in the 1990s, ecosystem services (ES) represent an important and still evolving concept that has the potential to redefine perspectives on human–nature relations towards a more holistic view that highlights our dependence on and responsibility for healthy ecosystems (Norgaard, 2010). An underlying hope of ecology and environmental economics is that the concept of ES can change the way ecosystems are considered in policy and planning and promote policy actions that will reduce environmental degradation and biodiversity loss while enhancing human well-being (e.g., MA, 2005; Schröter et al., in press).

Only recently have ES been discussed as a concept to aid *urban* planning and policy-making (Niemelä et al., 2010; Colding, 2011; Gómez-Baggethun et al., 2013). Particular barriers for integration of the ES concept as a heuristic tool for urban planning and policy-making are to be expected considering the need for (1) a change of planning paradigms and routines towards more systemic and holistic thinking, e.g., by linking ecological, social, and economic considerations (Norgaard, 2010; Scarlett and Boyd, in press); and (2) a shift towards more interdisciplinary thinking and coordination given that different fields in administration are usually in separate departments (Cowling et al., 2008; Primmer and Furman, 2012; Ahern et al., 2014). With the exception of these barriers, urban planning seems well positioned to adopt ES approaches, since consideration of multiple conflicting demands on use of land and natural resources has been a primary goal of the field since its emergence (Wilkinson et al., 2013).

So far, research on ES has primarily considered the relation to planning practice and stakeholder needs (Cowling et al., 2008; Gómez-Baggethun et al., 2013). A very small number of urban ES studies analyzed in a review by Haase et al. (2014) targeted implementation such as considering information needs of city authorities, integrating

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study results in planning processes, or developing assessment tools for planning (e.g., Li et al., 2005; Rall and Haase, 2011; McPhearson et al., 2013a). The perception of the ES concept by planning practitioners has been analyzed for several developed countries (Hauck et al., 2013; Albert et al., 2014; Matzdorf and Meyer, 2014), though few focused on professionals from planning and management of urban green space (Niemelä et al., 2010; Young, 2013). Most methodological approaches to assess the uptake and operationalization of the ES concept in urban planning include interviews with stakeholders and content analyses of plans and policies. These studies consider one to two cases such as Stockholm, Melbourne or Rotterdam (Wilkinson et al., 2013; Frantzeskaki and Tillie, 2014) or execute multiple-case studies within the same planning frame such as coastal cities in Poland (Piwowarczyk et al., 2013). However, a broader comparison for different urban contexts and planning cultures is missing. We undertook an analysis of different policy and planning contexts to better understand the gaps and linkages between the concept of ES and its implementation in urban plans and policies.

This analysis uses a discursive approach where explicit and implicit references to the ES concept are identified. Explicit reference indicate a conscious uptake of the ES concept while implicit references are understood to be based on similar conceptual understandings or underpinnings of urban ecosystems and their benefits without conscious linkages to the ES concept (Hauck et al., 2013; Wilkinson et al., 2013; Matzdorf and Meyer, 2014).

Therefore, this study seeks to answer the following questions based on a discourse analysis of planning documents comparing cities from Northern America as well as Western and Northern Europe:

1. How is the ES concept, in explicit and implicit terms, represented in different urban planning contexts?
2. To what extent are individual ES such as particular regulating or cultural ES represented in the planning documents? Which ES are referred to and how broad is the thematic scope within planning documents?

We suggest that discursive representation and explicit use of ES in different urban contexts indicates a new ecological approach to urban planning.

2. Material and methods

A cross-case comparative analysis of planning documents from five cities, supplemented by local expert knowledge, was conducted to explore the relationship between the ES concept and planning practice. We focus on European and US cities because these two regions represent different periods of time for entering discourses on ES as well as different planning cultures and paradigms. In the United States (US), there has been a surge in ES research in the past decade by federal governmental organizations such as the USDA Forest Service and the US Environmental Protection Agency which have supported awareness, and ES valuation studies have been conducted that are considered in planning and policy-making in some regions (Molnar and Kubiszewski, 2012; Scarlett and Boyd, in press; McPhearson et al., 2014). In Europe, the ES concept has only recently been promoted through European Union (EU) policy, for example in the Biodiversity Strategy to 2020 (EC, 2011) and the Green Infrastructure Strategy (EC, 2013). Attention in EU-member states has risen and scientific knowledge related to ES implementation and policy-making is recently evolving (Hauck et al., 2013; Albert et al., 2014; Matzdorf and Meyer, 2014)

The five case studies analyzed here including Berlin in Germany, New York City and Seattle in the US, Salzburg in Austria, and Stockholm in Sweden, represent different planning contexts, biogeographic regions and population sizes. They were selected based on the authors' local expertise and their role as case studies in the URBES project (Urban Biodiversity and Ecosystem Services), which helped secure in-depth knowledge of local governance contexts. The city of Seattle is not part of the URBES project but was included as a second case study from the US planning context since the city is well known for its innovative, participatory planning approaches and its efforts in sustainable urban development (Karvonen, 2010; Rouse and Bunster-Ossa, 2013).

During the URBES project and an additional research stay in Seattle the researchers had several points of interactions with stakeholders from the case study cities including interviews, discussion groups, workshops with urban planners and policy makers, and in-situ observations of decision-making processes where the ES concept was explored (for detailed information see Frantzeskaki and Tillie, 2014; McPhearson et al., 2014; Kabisch, 2015). Furthermore, a desk study on the biogeographic and historic context, the current planning system and important drivers of change such as adaptation to climate change or demographic change was conducted for each case study city based on review of literature and planning documents.

2.1. The case study cities and their planning contexts

The case study cities range in population size from 0.15 million in Salzburg to 8.2 million in New York City (Fig. 1). Berlin and New York are amongst the largest cities in their geographical regions. Berlin is a mono-centric and moderately dense city which represents the Germanic planning tradition, with a strong emphasis on formal land use planning based on federal law. However, the city is increasingly using informal strategic planning approaches. Situated along the northeast coast of the US, the New York metropolitan region encompasses an urban core with a high population density of 10,430 people/km² (US Census Bureau, 2010), surrounded by suburban and exurban housing development. To tackle the city's future challenges a landmark strategic plan, PlaNYC, was launched in 2007 with a mission of providing a vision for sustainable development. With its integrated and practical scope, PlaNYC has since gained international attention (Newman and Thornley, 2013).

Seattle and Stockholm represent medium-sized cities in coastal regions, which face immediate pressures from the effects of climate change. Seattle is located in the Puget Sound region in the Pacific Northwest of the US. Low-density development has led to urban sprawl in its urban metropolitan area. The planning system of the city and surrounding region is based on collaborative approaches and characterized by a high number of (informal) visions and strategies with regular plan updates and broad community participation.

The City of Stockholm is the capital of Sweden and is situated on a number of islands between the fresh water lake Mälaren and the brackish Baltic Sea. The city is dense and polycentric with a main central core. It is largely built up along metro lines and with substantial green and blue wedges entering into the city from different directions. Stockholm is a forerunner in Europe for sustainable urban development (Colding, 2013; Metzger, 2013). It also stands out in Europe for early adoption of the ES concept, since the concept was introduced in Swedish policy in the early 2000s and has since grown in importance (Lewan, 2000; Granath et al., 2012).

Salzburg was chosen to represent a small city in our sample. The city's Green Space Declaration, implemented in 1985 as a result of public pressure and increased environmental consciousness, is a crucial instrument aiming at protecting of the city's green space (57% of the whole area; Amt für Stadtplanung und Verkehr, 2009). The declaration is incorporated into the city's development concept of 2007 which is used in accordance with the Salzburg Regional Planning Act as the basis for the city's development.

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