



# Ecosystem services as technology of globalization: On articulating values in urban nature

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## ABSTRACT

The paper demonstrates how ecosystem services can be viewed and studied as a social practice of value articulation. With this follows that when ecosystem services appear as objects of calculated value in decision-making they are already tainted by the social and cannot be viewed as merely reflecting an objective biophysical reality. Using urban case studies of place-based struggles in Stockholm and Cape Town, we demonstrate how values are relationally constructed through social practice. The same analysis is applied on ecosystem services. Of special interest is the TEEB Manual that uses a consultancy report on the economic evaluation of Cape Town's 'natural assets' to describe a step-by-step method to catalog, quantify and price certain aspects of urban nature. The Manual strives to turn the ecosystem services approach into a transportable method, capable of objectively measuring the values of urban nature everywhere, in all cities in the world. With its gesture of being universal and objective, the article suggests that the ecosystem services approach is a technology of globalization that de-historicizes and de-ecologizes debates on urbanized ecologies, effectively silencing other—and often marginalized—ways of knowing and valuing. The paper inscribes ecosystem services as social practice, as part of historical process, and as inherently political. A call is made for critical ethnographies of how ecosystem services and urban sustainability indicators are put into use to change local decision-making while manufacturing global expertise.

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“You cannot manage what you do not measure.”

The Economics of Ecosystems and Biodiversity (TEEB), <http://www.teebweb.org/>, January 15, 2012.

“Everything is politics.”

Thomas Mann, *The Magic Mountain*, 1924.

## 1. Introduction

Rather than as a signifier of objective value, when ecosystem services are studied as one of several social practices of value articulation, they are opened towards debate and contestation on how to value nature and ecological complexity. This article focuses on such practices and uses the urban landscape as the quintessential place for such elaboration. Indeed, as cities continue to grow in size and numbers, increasing intellectual energies have been mobilized to develop analytical and policy tools that can be used to sensitize urban decision-making to complex biophysical processes. Alongside parks, greenbelts, urban gardens and areas of food production, with a history going back decades and

in some cases centuries (Barthel et al., 2010), there have in recent years been an upsurge of initiatives such as green dispersal corridors (Tannier et al., 2012), urban nature reserves (Borgström, 2009), and urban biospheres (Alfsen-Norodom, 2004), building explicitly on ecological knowledge. In this plethora of urban nature protection initiatives there has also been a growing interest in economic approaches, prominently that centered on ecosystem services, below ESS. ESS has been described as the biophysical processes that benefit society and human well-being (Daily, 1997; MA, 2005) and there is considerable expectation that an ESS approach<sup>1</sup> to the economics and management of

<sup>1</sup> We will use the expression ‘ESS approach’ when we refer to the integrated project of using the idea and concept of ecosystem services for a designated application. This means that we include the underlying scientific thinking, largely derived from ecology and economics (and ecological economics), related concepts, methodologies, principles as well as texts, documents, websites which codify these ideas and principles, the institutions and organizations set up to promote and implement them, including research institutions, designated educational programs, emerging consultancies, and, notably, the practices of researching, using, and applying ESS and the practitioners that are involved in this by now quite major undertaking. This admittedly wide definition has been chosen in order to include both the ideas—in the case of ESS we might even talk of an ideology, a certain belief-system to which we will return below—the institutions, and the practitioners. This is in some distinction from previous analyses which has talked about the ESS ‘framework’ (Norgaard, 2010) which is similar but in our view signifies a somewhat more static, readymade structure of institutions and principles. Our take on this is that the ESS approach is dynamic and plastic, evolves quickly and will continue to do so. Evidently our concept, the ESS approach, subsumes under it ‘ecosystem goods and services’ (MA, 2005) and methodologies like Total Economic Value (TEV) and Integrated Valuation of Ecosystem Services and Tradeoffs (InVEST; Daily et al., 2009) as methods for economic evaluation of ecosystems.

*Abbreviations:* ANT, Actor-Network Theory; ESS, Ecosystem services; MA, Millennium Ecosystem Assessment; NPM, New Public Management; ICLEI, ICLEI—Local Governments for Sustainability; TEEB, The Economics of Ecosystems and Biodiversity.

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space and resources will be able to significantly enhance the potential for nature protection and sustainability in cities and urban regions (Bolund and Hunhammar, 1999; Elmqvist and Maltby, 2010; Ring et al., 2010; TEEB, 2010).

However, there are also indications that this might not be the case and the literature that expresses concern with the ESS approach has been growing considerably over the last few years, not least in this journal (see below). We are at present in a situation when it has become increasingly urgent, therefore, to analyze the ESS approach. How can we understand its appeal in discussions of urban green planning and how shall we regard its potential function in the ongoing quest for urban sustainability? This paper aims to contribute to a timely and critical reflection upon the concept of ecosystem services and the academic and political project in which it has been embedded.

ESS has made a rapid career as a concept and in urban sustainability discourse. It started as a heuristic metaphor, alluding to a difficulty to operationalize and elusive, still essentially economic value. However, since the late 1990s, there has been a gradual turn towards a framework for defining 'value of nature', with quantification and pricing as a standard practice of what became increasingly referred to as ecosystem services (early publications are Costanza et al., 1997; Jansson and Nohrstedt, 2001; and now a dedicated journal exist called *Ecosystem Services*). Why the concept became ecosystem services is not entirely clear—'nature's services' was used still in the late 1990s (Daily, 1997)—although it certainly reflected the hegemonic role of ecologists, and of environmental and ecological economics, in the ESS approach, despite the fact that the range of services go far beyond ecological expertise, for example productive soils or clean water (clearly the expertise of soil scientists, agronomists, hydrologists, biogeochemical experts, etcetera), not to speak of 'cultural ecosystem services' including aesthetic appreciation and spiritual experience.

This transition from metaphor to operationalized and institutionalized framework, which has been presented in the ESS approach as a science-based development, is crucial for the understanding of ESS in current urban decision-making. One of the key points in this article is to demonstrate that when ecosystem services appear as objects of calculated value—guided by the ambition to attain influence in decision-making—they cannot be viewed as reflecting an objective biophysical reality, but should be understood and researched as a social practice to articulate value. Indeed, we aim to show how ecosystem services are socially and culturally embedded, and how they can be researched as such. This is done in three steps. After having reviewed the growth and critique of ESS, we first demonstrate how the ESS approach can be viewed as one among several ways to articulate value in urban environments. We here position the ESS approach against a backdrop of literature on urban contestations over green space. Through case studies of place-based struggles we describe other practices of value articulation, animated by local, or in-place ways of knowing and valuing. We then apply the same analysis on the ESS approach, showing how this type of value articulation is distinct through its gesture of being quantitative, universal, objective, and science-based. In a third step, we strive to account for the emergence and function of the ESS approach in contemporary discourse on urban sustainability by interpreting the ESS approach within recent processes of globalization, drawing in particular on the literature on new public management (NPM). Most commentators would have it that the increasing use of ESS is due to an ecological crisis and a perceived need to handle complexity. We argue that an often overshadowed reason lies in that the ESS approach simply fits well with a different type of change, namely a particular transformation of governing over the last thirty years towards standardizing management and accountability. This transformation has matured within other fields of governing (e.g. water billing, medical care, and even library services) and now finds a partner in the ESS approach to include, within its realm, the governing of ecological complexity. Thus, the paper's main contribution lies in showing how ESS can be viewed and researched as a relational practice to articulate value, and how the ESS

approach is part of globalization, embedded in a wider historical and political process of change in governing. In conclusion, we suggest certain effects that the ESS approach brings, and how those could be researched. Throughout we will use some conceptual tools derived from Science and Technology Studies literature, and its use of actor-network theory (Latour, 2005; Law, 2009; Sismondo, 2004).

## 2. Emergence and Growth of ESS

Although the idea of economically beneficial services in nature is in itself more than a century old, used frequently among the first generation of nature conservationists who quickly learned that money was a convincing argument (Barrow and Mark, 2009), ESS (or nature's services) as a concept was coined only in the 1970s (Westman, 1977). It generated emerging interest in the 1980s and saw a rapid increase in usage in the following decades (Norgaard, in press). Since the middle of the 1990s there has been an exponential use of the concept in wide strands of ecological, resilience, landscape, and planning literatures, and since the late 1990s increasingly also in urban research (Bolund and Hunhammar, 1999) (Fig. 1).<sup>2</sup>

Early attempts to operationalize the ESS concept were carried out by prominent ecological economists, aided by ecologists, and were focused on estimating through a kind of thought experiments or simulations what the economic value of a given ecosystem service might be, with the manifest aim to solidify otherwise elusive or contested values. The ambition was normative; through the language of economics, nature's values should become less contested, better cared for and the life-sustaining properties of Earth maintained. These thought experiments were, needless to say, both vague and conditioned on a number of unknown factors such as future supply and demand, regional scales, available technologies, etcetera. They were also provided on any given scale, from the local, which were the most common, to the global, where nothing less than the 'economic value' of the entire bio-productive capacity of the world was heroically (and controversially; see e.g. Sagoff, 1997; Nature, 1998; Bockstael et al., 2000; WSTB, 2004) calculated (to be a minimum of 33 and up to 65 trillion US dollars; Costanza et al., 1997). The normative motivations were explicitly stated already in the introductory chapter of Gretchen Daily's pioneering collection *Nature's Services* (Daily, 1997) and has become a core message in the now formalized attempts to mainstream ESS as a principal means to safeguard preservation of nature and human well-being through high-powered initiatives like The Millennium Ecosystem Assessment, sponsored by United Nations (MA, 2005), The Natural Capital Project, sponsored by Stanford University, The Nature Conservancy and the World Wildlife Fund (Daily et al., 2009), and The Economics of Ecosystems and Biodiversity initiative (TEEB), hosted by the United Nations Environment Programme (UNEP; Ring et al., 2010)<sup>3</sup>. This has included

<sup>2</sup> For search string (a) on 'ecosystem services' the number of articles found was 3 820 of which top scoring institutions were the Chinese Academy of Science (with 102 articles), Stanford University (100), Wageningen University (99), and Stockholm University (90). Most articles were published in *Ecological Economics* (231), followed by *Shengtai Xuebao Acta Ecologica* (112). For search string (b) on 'urban ecosystem services', 449 articles were found with top scoring institutions being Chinese Academy of Science (42; including Research Centre for Eco-Environmental Science), Beijing Normal University (18), and Stockholm University (17), with most articles published in *Shengtai Xuebao Acta Ecologica* (37) and *Landscape and Urban Planning* (22). Of all records found, only those recognized as peer-reviewed articles and reviews were used, leaving out for instance conference proceedings.

<sup>3</sup> The aim to mainstream the ESS approach is stated in many documents. For instance, as stated boldly in the multi-authored article in *Frontiers in Ecology*, lead by ecologist Gretchen Daily and ecological economist Stephen Polasky: "The goal of the Natural Capital Project—a partnership between Stanford University, The Nature Conservancy, and World Wildlife Fund ([www.naturalcapitalproject.org](http://www.naturalcapitalproject.org))—is to help integrate ecosystem services into everyday decision making around the world. This requires turning the valuation of ecosystem services into effective policy and finance mechanisms—a problem that, as yet, no one has solved on a large scale." (Daily et al., 2009: 21). The project is "developing a software system for quantifying ecosystem services across land- and seascapes, called *inVEST*" that "uses a flexible, modular, and 'tiered' modeling approach to ensure that the models are useful world wide" (p. 22).

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