



The political ecology of ecosystem services



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ABSTRACT

The dominance of “ecosystem services” as a guiding concept for environmental management – where it appears as a neutral, obvious, taken-for-granted concept – hides the fact that there are choices implicit in its framing and in its application. In other words, it is a highly political concept, and its utility depends on the arena in which it is used and what it is used for. Following a political ecology framework, and based on a literature review, bibliometric analyses, and brief examples from two tropical rainforest countries, this review investigates four moments in the construction and application of the ecosystem services idea: socio-historical (the emergence of the discourse), ontological (what knowledge does the concept allow?), scientific (difficulties in its practical application), and political (who wins, who loses?). We show how the concept is a boundary object with widespread appeal, trace the discursive and institutional context within which it gained traction, and argue that choices of scale, definition, and method in measuring ecosystem services frustrate its straightforward application. As a result, it is used in diverse ways by different interests to justify different kinds of interventions that at times might be totally opposed. In Madagascar, the ecosystem services idea is mainly used to justify forest conservation in ways open to critique for its neoliberalization of nature or disempowerment of communities. In contrast, in the Brazilian Amazon, the discourse of ecosystem services has served the agendas of traditional populations and family farm lobbies. Ecosystem services, as an idea and tool, are mobilized by diverse actors in real-life situations that lead to complex, regionally particular and fundamentally political outcomes.

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Introduction

‘Ecosystem services’ (ES) is one of the buzzwords of environmental management at the beginning of the 21st century. This concept directs our attention to humanity’s dependence on ecosystems and ecosystem processes for food production, for regulation of climate and water resources, for aesthetic and spiritual values, and for basic, underlying life-supporting processes like photosynthesis and soil formation. Scientists, policymakers, and practitioners have used the concept to justify a wide array of environmental initiatives (Costanza et al., 1997a; Daily, 1997; MEA, 2005a,b; Kumar, 2012). The crowning moment of ES was its high-profile use in framing the 2005 *Millennium Ecosystem Assessment*, a report sponsored by a who’s who of international environmental agencies (MEA, 2005a,b).

Current use of the ES idea demonstrates a relatively tight conformity of definition. It is centered on four main elements:

- **something out there** (ecosystems, nature, forests, watersheds...),
- **provides things** (resources, goods, products, services...),
- **useful to people and/or nature** (health, livelihoods, fundamental life-support systems, species...),
- **and this should be valued** (often in monetary terms).

As the third and fourth elements indicate, some fundamental differences arise, however, between those who emphasize ecosystem functioning and attributes, versus those who focus more specifically on the benefits – or calculable value – for humans (Boyd and Banzhaf, 2007; Fisher et al., 2009; Nahlik et al., 2012; Lele et al., 2013). ES tend to be divided into four main categories. *Regulating* services are the benefits gained from ecosystem processes such as air quality, climate, water, erosion, waste, diseases, pests, pollination, and hazard mitigation. *Provisioning* services are the direct products we obtain from ecosystems, like food, fiber, fuel, and water. *Cultural* services are non-material, such as education, spiritual values, and recreation. *Supporting* services are the indirect or long-term processes that are necessary for the

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production of the previous three categories of service, like soil formation, photosynthesis, and nutrient cycling (MEA, 2005a,b, p. 40).

The ES concept has gained impressive rhetorical and scientific power in the last two decades. On the scientific side, over two thousand journal articles contain ES as a keyword, with top outlets including *PNAS*, *Environmental Management*, *Biological Conservation*, *Ecological Economics* and *Ecology and Society* (Schaich et al., 2010). On the policy side, major international environmental NGOs like the World Wide Fund for Nature (WWF), the Wildlife Conservation Society (WCS), and the International Union for the Conservation of Nature (IUCN) have incorporated ES into their programs. The Convention on Biological Diversity (CBD) makes an explicit link between biodiversity and ES within its Strategic Plan for Biodiversity 2011–2020. ES has been central to the construction of new, high profile multi-institutional international environmental programs such as TEEB (The Economics of Ecosystems and Biodiversity) and IPBES (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services). At a national level, numerous funding councils have made calls for research linked to ES, often with explicit links to policy. As just one illustration, the British government finances a £40 m research program linking its development agency (DFID) and its national science agencies (NERC and ESRC), titled *Ecosystem services for poverty alleviation*.

Both an applied and critical literature has accumulated quickly. On the one hand, many practitioners and scholars seek ways to operationalize the concept, apply it in particular case studies, or frame their arguments with it. Some attempt to circumscribe definitions and tools to be able to use the concept in economic models (e.g. Fisher et al., 2009; Johnston and Russell, 2011). Others analyze the loss or degradation of ES (e.g. Lant et al., 2008), or seek to work out the mechanisms by which payments for ES can be implemented (like TEEB). On the other hand, a variety of scholars, including both users of the concept and external observers, critique the ES idea (Schröter et al., 2014). From an ecological perspective, the concept is criticized for obscuring ecological functions (Peterson et al., 2009) or leading to unjustified simplifications (Norgaard, 2010; Swift et al., 2004). From a strategic perspective, some see the concept as too broad, easily confused with others such as environmental services or landscape multifunctionality (Lamarque et al., 2011), while others critique its political efficacy (Van Hecken and Bastiaensen, 2010). Finally, from a social perspective, scholars critique the way in which the concept avoids consideration of crucial social, political and contextual factors (Corbera et al., 2007; Daw et al., 2011; Fairhead et al., 2012; Barnaud and Antona, 2014). Furthermore, scholars critique the way in which the concept, despite its merits, reflects and reinforces certain market-based models of society and underlying ideologies (Gómez-Baggethun et al., 2010; Brockington 2011). Critical scholars see ES as a neoliberal approach to the environment that commodifies nature and creates new sites for capital accumulation largely in the hands of a global elite (Heynen and Robbins, 2005; McAfee, 1999, 2012a,b; McCarthy and Prudham, 2004).

Concern over environmental transformations and environmental protection long precedes 'ecosystem services'. And ES is only one out of many possible ways of framing environment–society relationships. This begs a number of questions. What explains its meteoric rise as a dominant tool to think about environment–society relations? What does it reflect about today's society? What are its advantages and disadvantages? Who gains from it, who loses? Is it an indispensable tool to save nature in the modern world, a further appropriation of nature by capital, or something else altogether?

In this article, we seek to build a bridge between social science critiques and the ways in which practitioners have used the concept. We seek to understand more specifically how the notion

works, how it is used, what the notion allows and does not allow, and what its impacts are. As these objectives specifically engage with winners and losers in terms of environmental management, the power structures and discursive frameworks that facilitate such outcomes, and the specific regional ecological and social contexts in which the concept is used, we have labeled our approach a "political ecology" of ES. We argue that the utility of the ES concept depends on the arena where it is used and what it is used for. ES is not simply a tool in neoliberalization of nature, but a rhetorical concept that is used as such, and must be understood as such, with sometimes divergent outcomes. ES as a concept and tool is more complex than it has been argued in many neoliberal nature theorizations. This is not only due to the nature of nature or to the nature of capitalism, but to the very notion itself, which has been marked, since its creation, by many debates among ecologists, economists, and policy makers.

Approach: theory and method

What do we mean by 'doing a political ecology of ecosystem services'? We do so in the sense that political ecology is a research approach or posture that addresses nature–society phenomena – whether concrete local cases of environmental change or abstract global concepts like ES – using historically and geographically contextual approaches. More specifically, political ecology guides researchers to pay attention not only to the 'ecology' or science of the topic at hand, but also to the agency of ideas and the actions of social, economic, and discursive power across scales. The approach pays particular attention to who wins, who loses, and what the impacts are for different parts of society and different components of the environment (Robbins, 2012; Gautier and Benjaminsen, 2012). In the words of Tim Forsyth (2005, p. 165), who uses political ecology to investigate the 'ecosystem approach' idea, political ecology "does not suggest that environmental problems do not exist, or that ecological science cannot help, but acknowledges the greater political controversies about the nature of ecological risk, and the influence of different political actors upon what is seen to be authoritative knowledge." It differs from apolitical approaches to understanding environment–society concepts, like Timothy Farnham's history of 'biological diversity'. Farnham (2007, p. 5–6) ascribes the success of that concept to its encompassing breadth and its ability to strike a chord with different interest groups, but dwells less on the underlying politics.

Political ecologists have already produced a number of critical analyses touching on the ES concept. The main critics investigate ES as a tool of a neoliberal conservation, of market-based environmental policy, or as a project of 'green grabbing' that creates new markets and empowers new actors (Arsel and Büscher, 2012; Fairhead et al., 2012; Bumpus and Liverman, 2011; MacDonald and Corson, 2012). ES can reinforce unequal power relationships (Corbera et al., 2007) or lead to social injustice (Daw et al., 2011; McAfee, 2012a; Sikor, 2013). While the ES concept did not imply such outcomes, its use in the particular political and economic situations of recent decades conditioned these outcomes (Gómez-Baggethun et al., 2010; Gómez-Baggethun and Ruiz-Pérez, 2011). In addition, political ecologists, among others, have shown that the metrics used for such services lay on instable values and uncertainties that compromise the possibility of the commodification of nature on stable metrics (Robertson, 2006; Barnaud et al., 2011; Ernstson and Sörlin, 2013).

Nevertheless, some authors suggest that these are not default characteristics of ES, and that the use of ES does not necessarily signal adherence to an ideology of 'neoliberalisation of nature' (Dempsey and Robertson, 2012). First of all, green neoliberalism as conceptual framework has numerous fragilities: it is not a single project (Bailey and Caprotti, 2014), and the multi-dimensional

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