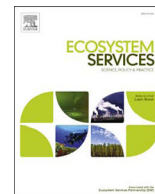




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Stakeholders' perspectives on the operationalisation of the ecosystem service concept: Results from 27 case studies

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ABSTRACT

The ecosystem service (ES) concept is becoming mainstream in policy and planning, but operational influence on practice is seldom reported. Here, we report the practitioners' perspectives on the practical implementation of the ES concept in 27 case studies. A standardised anonymous survey ($n = 246$), was used, focusing on the science–practice interaction process, perceived impact and expected use of the case study assessments. Operationalisation of the concept was shown to achieve a gradual change in practices: 13% of the case studies reported a change in action (e.g. management or policy change), and a further 40% anticipated that a change would result from the work. To a large extent the impact was attributed to a well conducted science–practice interaction process (>70%). The main reported advantages of the concept included: increased concept awareness and communication; enhanced participation and collaboration; production of comprehensive science-based knowledge; and production of spatially referenced knowledge for input to planning (91% indicated they had acquired new knowledge). The limitations were mostly case-specific and centred on methodology, data, and challenges with result implementation. The survey highlighted the crucial role of communication, participation and collaboration across different stakeholders, to implement the ES concept and enhance the democratisation of nature and landscape planning.

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1. Introduction

The dual concepts of natural capital (NC) and ecosystem services (ES) have matured over the last 30 years and are becoming mainstream in policy and planning. Major global initiatives such as the Millennium Ecosystem Assessment (MA, 2005), The Economics of Ecosystems & Biodiversity (TEEB, 2010), and the more recent Intergovernmental Platform on Biodiversity and Ecosystem Service (IPBES) (Díaz et al., 2015) have championed the concepts. The concepts are also becoming increasingly integrated in local-level decision-making, for example in urban planning (Kopperoinen et al. 2015; Maes et al., 2016), in national park management (Cairngorms National Park Authority, 2012; García-Llorente et al., 2016; Gómez-Baggethun et al., 2013; Palomo et al., 2014), and within river basin management plans (Grizzetti et al., 2016a).

In recent years there has been an exponential rise in the number of academic papers reporting aspects of the implementation, or so called operationalisation of the ES concept (see Jax et al., this issue). This includes work from the case study areas considered in this paper, which investigated: mapping ES (Baró et al., 2016; Clemente et al., 2015; García-Nieto et al., 2015; Lique et al., 2015; Palomo et al., 2013), modelling ES (Baró et al., 2014; Lique et al., 2016b), valuation assessments (Martín-López et al., 2014), and integrated assessment of ES (Langemeyer et al., 2016).

In addition, issues of scale (Bezák et al., 2017; Kovács et al., 2015), temporal aspects (Dick et al., 2016), and the linkages between biodiversity and ES (Gonzalez-Redin et al., 2016; Lique et al., 2016a) have been studied in the case studies. Stakeholder engagement (García-Nieto et al., 2015), governance (Primmer et al., 2015) and the linkages between ES and human wellbeing (Kelemen et al., 2015; Tenerelli et al., 2016) are arguably less well researched. In the literature there are many similar examples where researchers draw on theory-based argumentation, large datasets and/or case studies, to test the utility of the ES concept. However large scale case study comparisons on how the ecosystem service concept can be operationalised, and how the knowledge is applied in practical terms are lacking. Few studies have assessed the impact of such research on the ES knowledge users (Posner et al., 2016; Saarela and Rinne, 2016), whose perspectives are vital if we are to make these concepts useful in real-world planning and decision-making. This paper addresses the apparent knowledge gap in the systematic understanding of the usefulness of the ES concept for practitioners, by answering the question: *In what ways does the ecosystem service concept help practitioners address their specific real-world, ecosystem management needs?*

It is now acknowledged that the analysis of ES requires interdisciplinary approaches i.e. working across academic boundaries (Nesshöver et al., 2016). Despite the recent acknowledgment that funding bodies may discriminate against interdisciplinary research (Bromham et al., 2016), European funding streams are promoting not only interdisciplinary, but also transdisciplinary research (Lyall et al., 2015), which aims to integrate information from various

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