Ecosystem Services ∎ (∎∎∎∎) ∎∎∎–∎∎∎

Contents lists available at ScienceDirect

Ecosystem Services

journal homepage: www.elsevier.com/locate/ecoser

Governance of Ecosystem Services: A framework for empirical analysis

Eeva Primmer [a,*], Pekka Jokinen [b], Malgorzata Blicharska [c,d], David N. Barton [e], Rob Bugter [f], Marion Potschin [g]

[a] Finnish Environment Institute (SYKE), Finland
[b] University of Tampere (UTA), Finland
[c] Swedish University of Agricultural Sciences (SLU), Sweden
[d] Swedish Biodiversity Centre, Sweden
[e] Norwegian Institute for Nature Research (NINA), Norway
[f] Alterra, Part of Wageningen University and Research, The Netherlands
[g] Centre for Environmental Management, University of Nottingham, UK

ARTICLE INFO

Article history:
Received 17 October 2014
Received in revised form
8 April 2015
Accepted 11 May 2015

Keywords:
Ecosystem services
Biodiversity conservation
Governance
Policy implementation
Arguments

ABSTRACT

Biodiversity conservation policies justified with science and intrinsic value arguments have produced disappointing outcomes, and the need for conservation is now being additionally justified with the concept of ecosystem services. However, little, if any empirical attention is paid to ways in which different types of ecosystem service decisions are made, to what arguments are effective in turning policy into practice and further into conservation outcomes and, in general, to how ecosystem services are governed. To close this gap, this paper identifies the different modes of governance in policy implementation from biodiversity and environmental conservation literature and incorporates them in a conceptual model of ecosystem services commonly utilised at present, the cascade model. The resulting conceptual framework encompasses: (1) hierarchical governance; (2) scientific-technical governance; (3) adaptive collaborative governance; and; (4) governing strategic behaviour. This comprehensive framework provides a structure for empirical analysis of ecosystem services governance, which takes into account the people and organisations making decisions, and, in particular, the different arguments that are used when implementing policies. The framework will facilitate holistic ecosystem service analyses and support policies in generating conservation and sustainability impact.

1. Introduction

The global consensus on the importance of biological diversity and the need to conserve it has been formalised in numerous agreements and strategies (e.g. UN, 1992; EC, 2011). Stopping species extinctions and protecting a proportion of land area have been set as explicit targets. The rigorous evaluation of these targets over recent decades has, however, produced disappointing results, revealing that the apparent political will and carefully drafted policies have not halted biodiversity decline (Rodriguez et al., 2004; Rands et al., 2010). The failure to protect habitats from degradation and conversion, or species from decline and extinction, has forced scientists and decision-makers to take an increasingly holistic approach to conservation, which recognises humans as important beneficiaries of nature. As a result, the arguments for biodiversity conservation now address the complex social–ecological interactions and the multiple benefits that ecosystems provide to people (Cardinale et al., 2012). As an argument-making device, the so called ecosystem service approach enters a wider set of social and political processes, involving a range of complex strategies and motives (Haines-Young and Potschin, 2014; Turnpenny et al., 2014). There is an expectation that the holistic ecosystem service approach would eventually be embedded in these processes; constitute a basis for policy design and be integrated in governance at all levels.

The holism is well warranted but, as research concentrates on producing knowledge about ecosystems and their value for humans, the issues of decision-making, policy implementation and governance are largely ignored. Simply assuming that decisions will eventually change, as new knowledge about ecosystem services is produced, is a significant impediment for the conservation and sustainable use of ecosystem services. This assumption does not take into account the complex interactions within and across the governance systems that may have implications for actual implementation of policies (Nie, 2003; Ratamäki et al., 2015).

* Corresponding author.
E-mail address: eeva.primmer@ymparisto.fi (E. Primmer).

http://dx.doi.org/10.1016/j.ecoser.2015.05.002

Therefore, the way in which new knowledge feeds into decision-making should be a target of analysis itself, building on explicit research on how ecosystem services are governed, how policies are implemented and what arguments are used in these processes.

The limited attention to policy implementation and governance in the ecosystem service context is surprising, given the empirical evidence base that biodiversity conservation and environmental management analysts have accumulated over the last 50 years. To close this gap, this paper identifies the different modes of governance in policy implementation from biodiversity conservation and environmental management literature and incorporates them in a conceptual model of ecosystem services commonly utilised at present, the cascade model (Potschin and Haines-Young, 2011). The cascade model is a useful simplification of the real world, communicating the relationships between ecosystem services and human well-being at a general level. The model has been applied, criticised and elaborated, to better address particular relations and issues, such as ecosystem service supply and demand (Potschin, 2015). Our analysis elaborates the model with governance aspects.

We propose a framework for empirical analysis of ecosystem services governance. We start by laying out the way in which the ecosystem service framework is expected to broaden the arguments for conserving biodiversity and for generating better conservation outcomes. We then review empirical biodiversity and environmental governance literature, paying attention to different implementation mechanisms that represent distinct modes of governance as well as the ways in which the effects of arguments for biodiversity conservation are evaluated within each governance mode. We conclude by placing the identified governance modes into the conceptual framework of ecosystem services, and discussing the relevant interactions and feedback between governance modes and the particular components of the ecosystem services model. The resulting conceptual framework encompasses: (1) hierarchical top-down governance; (2) scientific-technical governance; (3) adaptive collaborative governance; and, (4) governing strategic behaviour. This comprehensive framework provides a structure for empirical analysis of ecosystem services governance, which takes into account the people and organisations making decisions, and, in particular, the different arguments that are used when implementing policies. The framework will facilitate holistic ecosystem service analyses and support policies in generating conservation and sustainability impact.

2. Conservation effects and the concept of ecosystem services

Evaluation of the effects of specific biodiversity conservation policies usually focuses on the outcomes and impacts, rather than on the ways in which governance turns the policies into practice. The effects and evolution of the arguments for conservation expressed in the design of the policy goals are not generally followed through when evaluating the policy or the various processes of implementation that make up governance and eventually produce conservation effects.

Effectiveness indicators, such as hectares of protected areas and numbers of endangered species, have a well acknowledged (and well deserved) status in biodiversity conservation reporting, and more detailed analyses mostly take these as a proxy for the effectiveness of protection strategies. For example, evaluating conservation action plans takes species status as a surrogate for conservation effects (Laycock et al., 2009) and a more elaborate cost-effectiveness analysis uses detailed species-habitat information for measuring effects of different parcel sizes for protected areas (Mönkkönen et al., 2011). Elsewhere, forest cover is used as the proxy for effect in cost-effectiveness analyses of conservation payments (Ferraro and Simpson, 2002) and protected areas (Andam et al., 2008). In an analysis of cost-effectiveness of the European Natura 2000 Protected Area Management Plans, Wätzold et al. (2010) identify various sources of costs, and thus take a step further in considering the different activities required for implementing the protected area targets. Generally, however, effectiveness evaluations pay little attention to what activities and which arguments direct the decisions and the resources, further shaping the practices that deliver the conservation output.

The heavy reliance on simplified measures of conservation effects in evaluating policies is surprising, given the extent of knowledge about biodiversity and the evolving variety of arguments for conservation. For example, biodiversity conservation policies relying on ethical and moral arguments for protecting nature (Sagoff, 1996) have gradually been backed up by elaborate science-based arguments about the habitat condition, size and connectivity that species and populations require (e.g., Hanski 2000; Margules and Pressey, 2000; Sutherland et al., 2004; Huth and Possingham, 2011). Elsewhere, these ecological arguments have been supplemented by long-term benefit arguments, often operationalized through monetary values (Sagoff, 2011).

In the development of more diverse arguments for biodiversity conservation, the concept of ecosystem services represents a major attempt to capture the complexity and different value bases of conservation (Daily, 1997; Costanza et al., 1997; MA, 2005; Gómez-Baggethun et al., 2010; Potschin and Haines-Young, 2011). The conceptualisation of ecosystem services entails a bridge, or'cascade', from the ecosystem's biophysical structures and processes (supported by underlying biodiversity), to the benefits and values that humans experience (Potschin and Haines-Young, 2011, Fig. 1).

As highlighted in the literature applying the ecosystem services conceptual model (Potschin and Haines-Young, 2011) depicted in Fig. 1 and similar models (De Groot et al., 2002, 2010; Bateman et al., 2011; Mace et al., 2014; Van Oudenhoven et al., 2012), the crucial arguments for biodiversity conservation can be derived from the scientific understanding of each of the model's components: ecosystem structure, functions, services, benefits and values, as well as the relationships between these components. For example, understanding which elements of ecosystem structure and function contribute to the delivery of important services may motivate decision-makers to implement policies that aim at better conservation of these particular elements. There is an urge for further scientific analysis to support the understanding of each of the components of the model and, to add holism, the relationship between them. The results, then, are expected to allow further elaboration of arguments for ecosystem and biodiversity conservation.

By displaying a back-loop from values to ecosystem structures (and underlying biodiversity), the ecosystem services model displays an assumption that the knowledge of value and value arguments are necessary for governing ecosystem services and implementing biodiversity policy (Fig. 1). The reasoning goes that as many policy decisions are based on economic arguments, the

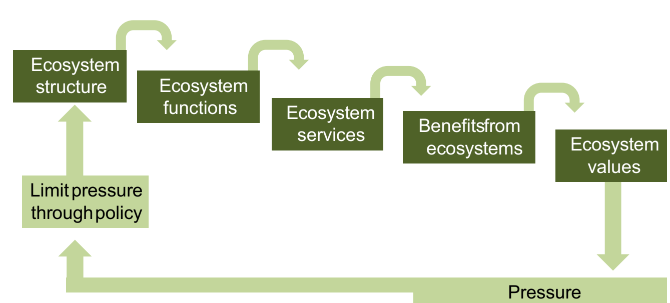

Fig. 1. A conceptual model for analysing ecosystem services ('cascade model'), adapted from Potschin and Haines-Young (2011).

Please cite this article as: Primmer, E., et al., Governance of Ecosystem Services: A framework for empirical analysis. Ecosystem Services (2015), http://dx.doi.org/10.1016/j.ecoser.2015.05.002