



Ecosystem services and poverty alleviation: A review of the empirical links



Helen Suich^{a,b,*}, Caroline Howe^{a,2}, Georgina Mace^{a,2}

^a ESPA, 1 Roxburgh Street, Edinburgh EH8 9TA, Scotland, UK

^b Environmental Change Institute, School of Geography and the Environment, University of Oxford, South Parks Road, Oxford OX1 3QY, UK

ARTICLE INFO

Article history:

Received 13 February 2014

Received in revised form

21 January 2015

Accepted 22 February 2015

Available online 26 March 2015

Keywords:

Ecosystem services

Poverty alleviation

Evidence

Impacts

ABSTRACT

We present the results of a review of the empirical evidence and of the state of knowledge regarding the mechanisms linking ecosystem services and poverty alleviation. The review was undertaken to determine the state of current knowledge about the scale and nature of these linkages, and focus the future research agenda. Research has, to date, focussed largely on provisioning services, and on just two poverty dimensions concerning income and assets, and food security and nutrition. While many papers describe links between ecosystem services and dimensions of poverty, few provide sufficient context to enable a thorough understanding of the poverty alleviation impacts (positive or negative), if any. These papers contribute to the accumulating evidence that ecosystem services support well-being, and perhaps prevent people becoming poorer, but provide little evidence of their contribution to poverty alleviation, let alone poverty elimination. A considerable gap remains in understanding the links between ecosystem services and poverty, how change occurs, and how pathways out of poverty may be achieved based on the sustainable utilisation of ecosystem services.

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1. Introduction

The ecosystem services literature has been expanding at a rapid rate (Abson et al., 2014; Raffaelli and White, 2013); an accumulation of research which covers conceptual and theoretical papers, review papers, those identifying gaps in the literature and opportunities for further research, descriptions of tools and methods, as well as empirical papers on particular places and ecosystems.

While early conceptual studies largely focussed on ecosystem functions and processes, following the Millennium Ecosystem Assessment (2005) the literature increasingly frequently addresses the links between ecosystem services and human well-being (Carpenter et al., 2009; Raudsepp-Hearne et al., 2010), recognising that social and ecological components must be understood jointly (as opposed to in isolation) and taking into account the feedbacks (Chan et al., 2012; Miller et al., 2012; Milner-Gulland, 2012) and

trade-offs (Howe et al., 2014) between them. Much of this literature now proposes systems of classification for (elements of) the linkages between ecosystem functions and well-being, as well as critiques and developments of these conceptualisations (Bateman et al., 2010; Fisher et al., 2014, 2013). Reviews focusing on specific geographical regions have also begun to emerge (Balvanera et al., 2012; Perevochtchikova and Oggioni, 2014).

The provision of ecosystem services (ES) are widely assumed to contribute to poverty alleviation, particularly in rural areas of developing countries and consequently the degradation of these services is also assumed to result in negative effects on human well-being (Tallis et al., 2008), or to undermine efforts to reduce poverty (Sjostedt, 2012). Indeed, much of the research into ES and well-being focuses on developing countries; perhaps arising from observations that declines in wellbeing have been associated with increases in dependence on ES (e.g. Shackleton and Shackleton, 2012), and because the livelihoods of the poor appear to rely most directly on the provision of ES.

However, arguments remain about the direction of causality – whether poverty creates or is a result of environmental degradation (Sandker et al., 2012). Beyond large scale correlative studies mapping global patterns of wealth, biodiversity and environmental change (Turner et al., 2012), little attention has been paid to understanding the ways in which ES actually do contribute to poverty alleviation, or even if is possible in practice.

* Correspondence to: Crawford School of Public Policy (Bldg No. 132), Lennox Crossing, ANU, Canberra 0200, ACT, Australia. Tel.: +61 2 6125 1497.

E-mail address: helen.suich@anu.edu.au (H. Suich).

¹ Present address: Crawford School of Public Policy, Australian National University, Canberra 0200, ACT, Australia.

² Present address: Centre for Biodiversity and Environment Research, Department of Genetics, Evolution and Environment, University College London, Gower Street, London WC1E 6BT, UK.

Many of the empirical studies purporting to deal with ES and poverty or wellbeing are really valuation studies, for example, demonstrating some kind of (usually monetary) value of ecosystem services or of their utilisation (Costanza et al., 1997; Ninan and Inoue, 2013), of their contribution to national economies (Lange and Jiddawi, 2009) or the distribution of costs and benefits of ecosystem service degradation or restoration (De Groot et al., 2013; Srinivasan et al., 2008). Few studies have examined relationships at anything less than a macro or aggregate level and most ignore the distribution of impacts, and are therefore inadequate for determining which groups actually benefit (and whether the poor are among the beneficiaries). Additionally many studies also focus only on income, rather than taking a multidimensional approach to poverty.

Consequentially, questions remain about the nature of the links between ES and the multiple dimensions of poverty, and about the mechanisms and consequences of changes in ES provision on different aspects of well-being (Fisher et al., 2013). Determining these causal pathways is particularly important with respect to developing appropriate and effective policies to achieve both the sustainable management of ES and poverty alleviation (Ash et al., 2010; Liebenow et al., 2012).

The purpose of this paper is therefore to review the empirical evidence regarding the state of knowledge of the links and mechanisms between ES and poverty alleviation, in order to improve knowledge about the scale and nature of these linkages, and focus the future research agenda. The specific questions we aim to address are:

1. Where, and under what circumstances have linkages between ES and poverty alleviation been studied? This includes consideration of the physical and social circumstances and context in which ES and poverty alleviation links have been identified and examined.
2. What are the actual linkages described and/or measured? This incorporates what aspect(s) of poverty have been addressed, which ES contributed and whether patterns can be identified across case studies.
3. Whether – and under what circumstances – the provision of ES contributes to the alleviation of poverty.

From this analysis, we hope to determine whether any generalisations can be made about the mechanisms that link multiple ES with multiple dimensions of poverty, and set this understanding into the broader area of where ES might be important for poverty alleviation (i.e. whether ecosystem-based pathways out of poverty exist), as well as identifying gaps in the evidence and where the focus of future research efforts should be.

The conceptual framework used for conducting this review is described below, and draws on a similar literature utilised for – and incorporates the range of indicators identified in – the conceptual frameworks relating specifically to the analysis of ecosystem services and poverty alleviation (see for example, ESPA, 2013; Fisher et al., 2014; 2013; Howe et al., 2013). The way in which this framework was operationalised is described in Section 2.

Poverty is recognised as being multidimensional, and is understood to have moved beyond a focus on income alone. Many dimensions of poverty have been identified including – but not limited to – food security and nutrition, health, income and assets, education and skills, property rights, etc. These are best understood in the context of surrounding social institutions, and as being driven by social processes.

Ecosystem services are the benefits that people derive from ecosystems (Millennium Ecosystem Assessment, 2005) but more specifically in our study are assumed to include the constituents, process and products of ecosystems that provide benefits for human

well-being (ESPA, 2013; Mace et al., 2012). That is, the framework includes the consideration of a range of services that have been categorised as provisioning, regulating, cultural and supporting services (UKNEA, 2011).

This review focus on bundles of ES (Reyers et al., 2013) and on multiple dimensions of poverty, because determining net poverty alleviation outcomes from ES provision (or a change in ES management) requires the examination of how these ES bundles impact directly and indirectly on multiple dimensions of poverty, and an understanding of the existence and nature of any feedback and interactions between these multiple elements. This is in contrast to much conceptual and empirical work which simply illustrates the connections between each group of ES and each dimension of poverty described (e.g. between provisioning services and food security or between regulating services and security), and does not address the mechanisms by which these elements are connected.

In terms of poverty alleviation, the review initially restricted evidence to an interpretation of ES contributing actively to an improving household situation. However, the dearth of empirical evidence regarding poverty outcomes led us to include both poverty prevention and poverty reduction (Angelsen and Wunder, 2003; Daw et al., 2011). This framework recognises the importance of social differentiation and of the key factors affecting differentiation (called ‘mediating factors’ here) in any analysis of these relationships. This has also been highlighted in the development of conceptual frameworks developed for the analysis of ecosystem services and poverty alleviation (Fisher et al., 2014).

2. Methods

A literature search of the Web of Knowledge was carried out between March 2012 and February 2013, using all possible combinations of the terms in Table 1. These terms were selected on the basis of their likelihood of returning empirical evidence regarding the actual and specific contribution of ES to poverty alleviation. The search terms were considered sufficiently broad and general to capture different, though comparable, definitions of ES and poverty alleviation.

Only peer-reviewed publications in English were considered, as we were only interested in evidence that had been subjected to the peer-review process. The year 2000 was chosen as the start date for the literature search, as it represents the start of the Millennium Ecosystem Assessment and a relatively consistent use of the terms ecosystems and ecosystem services. 398 papers remained in the database once duplications and non-peer reviewed publications had been removed.

2.1. Classification

Phase I determined the relevance of each paper to the questions posed in the introduction to this study, based on a read-through of the abstract. Papers were classified as relevant when the abstract discussed ES, poverty, and the links between them. In order to maximise

Table 1
Search terms used.

Ecosystem		Poverty
Ecosystem services		Anti-poverty
Ecosystem service*	AND	Poverty alleviation
Environmental services		Poverty elimination
Environmental service*		Poverty eradication
		Poverty reduction
Each term was surrounded by double quotes “ ... ”		

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