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Understanding the relationships between ecosystem services and poverty alleviation: A conceptual framework ☆

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ABSTRACT

As interest grows in the contribution of ecosystem services to poverty alleviation, we present a new conceptual framework, synthesizing insights from existing frameworks in social–ecological systems science and international development. People have differentiated abilities to benefit from ecosystem services, and the framework places emphasis on access to services, which may constrain the poorest more than aggregate availability. Distinctions are also made between categories of ecosystem service in their contribution to wellbeing, provisioning services and cash being comparatively easy to control. The framework gives analytical space for understanding the contribution of payments for ecosystem services to wellbeing, as distinct from direct ecosystem services. It also highlights the consumption of ecosystem services by external actors, through land appropriation or agricultural commodities. Important conceptual distinctions are made between poverty reduction and prevention, and between human response options of adaptation and mitigation in response to environmental change. The framework has applications as a thinking tool, laying out important relationships such that an analyst could identify and understand these in a particular situation. Most immediately, this has research applications, as a basis for multidisciplinary, policy-relevant research, but there are also applications to support practitioners in pursuing joint policy objectives of environmental sustainability and poverty alleviation.

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1. Introduction

Much policy momentum and research effort currently surrounds ecosystem services: the 'benefits people obtain from ecosystems' (MEA, 2005; v). This anthropocentric approach to nature promotes new thinking about the contribution of the environment to human wellbeing (Costanza et al., 1997; Daily and Matson, 2008). One area highlighted, but not extensively developed by the Millennium Ecosystem Assessment (MEA, 2005), directed attention towards the particularly significant contributions of ecosystem services to the wellbeing of the global poor, whose livelihoods are often directly dependent on services (Daw et al., 2011; Fisher, 2004; Cavendish, 2000). A focal point is developing, representing a coincidence of agendas between an environmental community seeking to broaden constituencies for sustainability (Roe, 2008), and the development community, responding in part to the changing characteristics and distribution of global poverty (e.g. Sumner, 2012; Chen and Ravallion, 2007; Wade, 2004), to become increasingly focused on the poorest (White and Anderson, 2001; Department for International Development, 2011). This field is now the focus of significant research effort (e.g. see ⟨www.espa.ac.uk⟩), and emerging policy attention, demonstrable, for instance, in policy initiatives around Payments for Ecosystem Services and Ecosystem-Based Adaptation.

To further the research agenda forged by the MEA, and assist with understanding linkages between ecosystem services, human wellbeing, and poverty, we present this Ecosystem Services and Poverty Alleviation (ESPA) conceptual framework. A brief note is required at this stage on definitions. We define ecosystem services in line with the MEA (2005) and elaborate in Section 2 how our conceptual framework advances these concepts. Our definition of poverty draws extensively from the 'Voices of the Poor' research (Narayan et al., 1999), and in turn the MEA (2003): human wellbeing is defined with reference to five components: basic material for a good life; security; health; good social relations; and freedom of choice and action. In turn, poverty and derivatives

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including 'poor' are defined as the deprivation of wellbeing (MEA, 2003; Narayan et al., 1999). A more comprehensive discussion of poverty alleviation can be found in Section 2.

By its nature, research in this field requires multidisciplinary collaboration, for which integrative conceptual frameworks are useful to make sense of complexity (Ostrom, 2009; Diaz et al., 2011). This framework builds on a review of existing frameworks used in the environmental and social sciences (Fisher et al., 2013) synthesizing insights from various disciplines such that this multidisciplinary research agenda will be better integrated and better conceptually supported. There are also policy applications, analogous to those of the Sustainable Livelihoods framework, in which the framework could be used by community leaders, government agencies, and NGOs, potentially in a participatory manner. The framework is specified for applications in developing country situations characterized by subsistence dependence on ecosystem services, and poverty. Whilst the applications are more obviously rural, the framework is also applicable to urban situations, an emerging research agenda (Ernstson et al., 2010; Elmqvist, 2011a). It is important to note here that whilst we focus on ecosystem services, we do not seek to overstate their importance. Clearly many factors, including access to healthcare and education, and freedom from conflict, also foster wellbeing, and their claims to long-term reduction of poverty may actually be more robust than claims surrounding ecosystem services.

This ESPA framework has been influenced by two fields that rely on frameworks in distinct ways. In international development, frameworks are commonly used as tools for analyzing situations or policy approaches. They tend to represent checklists, which are generally not enumerable. In developing this, we have also drawn upon social–ecological systems (SES) research. Here, frameworks tend to be represented diagrammatically, and may serve the purpose of conceptualization of a dynamic system as the precursor to an enumerated model.

Influenced by SES research, we present this framework diagrammatically, having previously noted the value of meaningful relationships between components, compared to checklists (Fisher et al., 2013). However, we anticipate that the translation of this to an enumerated model would not be straightforward because many elements are fundamentally qualitative. There are further benefits of considering the interaction between ecosystem services and poverty alleviation through an SES lens: such analyses can support the integration of natural and social sciences, and are associated with complex systems science and ideas of dynamism, non-linearity, uncertainty and thresholds (Janssen and Ostrom, 2006b). Because these are properties of the systems and situations we study (Carpenter et al., 2009; Rounsevell et al., 2010), SES approaches are useful. However as yet, systems approaches have little capacity for integrating analyses of power and politics (Cote and Nightingale, 2011), or human agency (Brown and Westaway, 2011). With a degree of novelty, this framework supports analysis of the political economy of access to and appropriation of ecosystem services.

The framework has also been influenced by development studies, where a number of factors promote frameworks. Development is policy-applied and inherently cross-cultural and development professionals are often required to travel to unfamiliar places to gather information and provide analysis. Frameworks are popular for these reasons: they provide a checklist, something to work from when a development professional walks in to a village. Sustainable Livelihoods (Scoones, 1998), for instance, is a tool that can be fruitfully applied to analyse most situations in the developing world, regardless of prior familiarity. It is not incidental that this framework developed from an intellectual tradition that had previously identified structural problems in the professional practice of development. Chambers wrote about the biases of 'development tourism': that professionals rarely visit remote communities, or travel during the wet season, tend to interact with the comparatively wealthy and powerful, and visit showcase villages and projects (Chambers, 1983). In such situations it is easy to overlook factors that are not immediately obvious, but may be nonetheless important. Comprehensive frameworks such as this one make things harder to overlook, but may also foster a lowest common denominator approach (Clark and Carney, 2008). Frameworks are powerful because they dictate what is on the agenda. This leads to a central limitation: if frameworks are used mechanistically or uncritically, they can hinder a deeper, questioning analysis, that remains open, for instance, to factors that do not feature in the framework (Carney, 2003).

2. A framework for analysing ecosystem services and poverty alleviation

Generic and comprehensive frameworks such as this are valuable as thinking tools to apply to a situation, for identifying important processes and detailing their character. Reardon and Vosti (1995) argue that studies of the poverty/environment nexus have tended to be too general in both areas, and hence context-specific analyses are important within this field. However, incorporating more contextual information will often mean dealing with higher levels of complexity. Compared to the MEA framework, this ESPA framework is larger and more complex; it unpacks the services/wellbeing nexus, supporting a systematic understanding of complexity. Ostrom (2009) argues that we should strive to understand the component parts of complex wholes, methodically dissecting the complexity, rather than artificially simplifying it.

Fig. 1 displays the diagrammatic framework representation. What follows is an expanded explanation of the framework with examples from diverse geographies, chosen solely for their illustrative capacity. The next section is structured to consider firstly ecosystems, the services they provide, and poverty alleviation. Central to the contribution of ecosystem services to wellbeing are considerations of social differentiation and whether people can access services, and this discussion therefore takes a prominent position. We then build outwards, noting innovations. The final section discusses potential applications and limitations of this ESPA framework.

2.1. The ecology of the framework

The ecosystem forms the foundation of the framework, comprising the set of biophysical processes and structures producing ecosystem services, used by people to support their wellbeing, as depicted in the rightwards progression of Fig. 1. We use Tansley's (1935) ecosystem definition (defined in Fig. 1), which encompasses the role of dynamic processes, and crucially, is scalable, meaning it can be defined according to the application, such that the ecological scale matches the social scale of focus. Whilst the framework is fundamentally anthropocentric, this section briefly discusses key ecological properties governing service provision, focusing upon ecological function, diversity, resilience and thresholds.

Ecological function describes the workings of ecological processes, such as the fluxes of energy and mass (carbon, nutrients) through an ecosystem. These functions directly support provisioning, supporting and regulating services, through transformations of matter and energy. However, such biogeochemical processes do not directly support cultural services, which are emergent properties of ecosystems, for instance, linked to flowering or ecosystem characteristics perceived by people as wild.

Some recent debate in the ecological literature surrounds the role of diversity, particularly biological diversity, in determining

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