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Special Section: Introduction

Beyond Money Metrics: Alternative Approaches to Conceptualising and Assessing Ecosystem Services

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Abstract

The concept and valuation of ecosystem services have emerged as growing and dynamic areas of research over the past few years. The adoption of these ideas and methods into mainstream policy discussions and practice has occurred at a rapid pace. Conventionally, the valuation of ecosystem services has been synonymous with estimating the economic (monetary) value of these services. However, monetisation has limitations that need to be acknowledged before it is adopted in policies. In addition, the socio-political and institutional dimensions of ecosystem services are largely overlooked in the debate. Against this backdrop, the Indian Society for Ecological Economics (INSEE) has put together this special section to critically review the current thinking and practices surrounding ecosystem services and to present emerging alternative approaches.

Keywords: ecosystem services, valuation, non-monetary dimensions, Millennium Ecosystem Assessment, environmental valuation, non-market valuation, ecological economics

INTRODUCTION

Decision-making based on economic valuation of ecosystem services is on the anvil as demonstrated by the extensive discussions in policy corridors around The Economics of Ecosystems and Biodiversity (TEEB)[1] and the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES)[2]. Governments commission studies on economic instruments such as payments for ecosystem services (PES) and take up large-scale measures to help conserve biodiversity and reverse environmental degradation[3]. Many policy documents adopt the vocabulary of the ecosystem services approach, implicitly or explicitly. The Sloping Land Conversion Program initiated by the Chinese government (Li et al. 2011) in the late 1990s, the Conservation Reserve Program in the United States, and the much-debated Stern Review on the Economics of Climate Change (2006)[4] commissioned by the British government are notable examples.

The pace with which the concept of ecosystem services, which emerged as recently as the early 1980s (Ehrlich and Mooney 1983), has evolved into an interdisciplinary discourse is remarkable. It has marched quickly through economic paradigms and valuation exercises (from Lynne et al. 1981; Ellis and Fisher 1987; through Costanza et al. 1997) to reach the corridors of international policy making in various manifestations. Most theoretical developments get adopted into policy frameworks only gradually following extensive research and much debate[5]. This fast pace partially reflects the widely perceived urgency in matters of environmental sustainability as well as a greater acknowledgement, in policy circles and academia, of the criticality of the health of the planet to human well-being (MA 2005). A bibliometric account of publications in the journal *Ecological Economics* classified by type and topic between 1989 and 2009 (Castro e Silva and Teixeira 2011) reflects this rapid transition of environmental

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issues from theory to applications and policies. A cursory analysis of publications since the year 2000 in the journal *Environment and Development Economics* also reveals the emerging interest in ecosystem services with approximately 55 out of 360 articles dealing with issues surrounding valuation of ecosystem services.

In India, a similar spate of research based on empirical studies and valuation techniques has occurred. The Indian Society for Ecological Economics (INSEE), affiliated to the International Society for Ecological Economics (ISEE), has been a catalytic agent in promoting interdisciplinary environmental research integrating socio-economic and biophysical aspects in natural resource management. At the INSEE Fourth Biennial Conference on 'Ecology and Human Well-being' in 2005, 10 of the 40 papers presented dealt with the valuation of ecosystems and their applications in the Indian context. In the policy arena too, there has been a growing focus on valuation of ecosystem services as seen, for example, in the appointment, under the directive of the Supreme Court of India in 2005, of the Expert Committee on Net Present Value entrusted with valuing forest land diverted for non-forest use[6]. The ongoing discussion of valuation-based 'green bonuses' to states under the 12th National Five Year Plan is another example (Anonymous 2011).

Though the empirical turn in ecological economics may not have been at the cost of scientific rigour (see Castro e Silva and Teixeira 2011), the hasty adoption of paradigmatic schema into policy decisions makes it necessary to review the academic path from the concept of ecosystem services to its current applications. Moreover, as valuation-based discussions originating in international dialogues enter national policy discussions, the need to review the progress and applicability of such approaches has become all the more imperative. It was against this backdrop that INSEE conceived this special section in *Conservation and Society* to critically review the current thinking and practice surrounding ecosystem services and emerging alternative approaches.

In the following section, we highlight a few contentions with a purely monetary assessment of ecosystem services for policy applications in environment, development, and natural resource management. Following this, we introduce the articles in this special section.

THE PERILS OF MONETISATION: QUESTIONABLE MEANS AND UNDESIRABLE OUTCOMES

Reflecting the influence of the dominant neo-classical school of thought, ecosystem services have conventionally been viewed as a type of capital, inherently perceived as substitutable with suitable technological interventions (Gomez-Baggethun et al. 2010). Translating the value of the ecosystem into economic terms was seen as the best way to communicate the worth and criticality of these services. These valuation exercises were based either on market prices, if such a market existed, or a value was imputed indirectly using one or a combination of valuation techniques (e.g., hedonic pricing, travel cost method, contingent valuation, etc.). Thus the valuation of ecosystem services was, and continues to be, primarily confined within the realms of monetary metrics.

Though monetisation of ecosystem services enabled ease of communication with policy makers and the public, the relatively fast journey of the discourse on ecosystem services into the domain of practice and policy has left a number of ambiguities and shortcomings unaddressed. Notions and concepts like 'social-ecological systems' (Berkes and Folke 1998) made explicit the complexities and multiple scales of functioning and interactions between humans and their natural environment. Consequently, the inadequacies of a unidimensional metric and the need for integrating across frameworks and policy interventions have started coming to the fore.

Questionable means

In the case of ecosystem services, particularly regulating and supporting services (as in the Millennium Ecosystem Assessment), which are often intangible, invisible, and are rarely 'marketed', it is difficult to identify a 'provider' who can claim absolute ownership of such services. When naturally occurring processes generate a flow of benefits across political boundaries, the question regarding the ownership of these service flows gets amplified. If no one can really own a service, given that nature is the ultimate provider, can the monetisation of the worth of the service go beyond informing the continued relevance of these services? If this is indeed the case, then the academic and policy relevance of these valuation efforts would be minimal.

If one were to recognise nature as the ultimate owner, and humans as intermediaries in the provision of services of an ecosystem, we may consider them as 'mediators', rather than owners. Even if a (set of) mediator(s) is (are) identified, in reality, the concept of ownership/mediation may not be perceived or acknowledged by them or others. Placing a monetary value may not necessarily contribute to a mediator's acknowledgement of the value of an ecosystem service. Moreover, the concept of ecosystem services, in the partitioned sense of regulatory-cultural-provisioning, may not prevail in many communities. In such situations, invoking the participation of communities in their roles as either mediators or benefactors of these services may, in reality, prove difficult.

Issues of ownership of ecosystem services notwithstanding, if monetisation is assumed to capture the true value of an ecosystem service, the question remains as to whether these values can be used in policies and practices involving payment mechanisms. In the event that the notion of ecosystem service is actually perceived and understood by concerned communities, the monetary valuation of the same may have little relevance to the community. This may be the case particularly amidst communities distanced from mainstream market economies that may not recognise money as a numeraire. As pointed out by Wunder (2005), in examining the scope for a payments for ecosystem service (PES) instrument, "if a PES takes off, how will direct, contingent benefit transfers work in

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often remote, cash-poor communities, both as resource-use incentives, and in terms of local livelihood dynamics?" Even amongst communities that widely use a monetary transaction mechanism, imposing an external mechanism or measure of valuation could trigger conflicts and may not serve the purpose of conservation or livelihoods. The experience of Kani tribes in the Agasthyamalai hills in Kerala serves as an example of such a scenario. *Jeevani* (*Trichopus zeylanicus travancoricus*), a plant extract sourced from the Agasthyamalai hills was found to have medicinal value and soon, a formula was worked out whereby the Kani tribes accrued a share of profits from *Jeevani* sales (Anuradha 1998). However, this flow of money created much social deliberation and conflict, but with no discernible impact on livelihoods or conservation goals. Monetisation of ecosystem services therefore, does not, by itself, account for the livelihoods and socio-cultural dynamics of local communities.

Undesirable outcomes

As Brondizio and Gatzweiler (2010) caution, a market-based approach engenders the risk of overlooking the socially and culturally constructed narrative of ecosystems and economies. Besides failing to account for its impact on socio-cultural dynamics, economic valuation ignores the socio-cultural underpinnings of power and its distribution. For instance, an ecosystem service may be a service for one but a dis-service to another (see Lele et al., this issue), or the sustenance of a chosen flow of services may adversely affect another individual or community. In the presence of such trade-offs, monetary power often dictates the eventual outcome of the conflict, and consequently, current inequalities in resource allocation and power persist into the future while conservation objectives remain unmet. The distribution of power is often ignored by most valuation models (Martínez-Alier 2002) and hence the very technique of valuation may be heavily biased reflecting existing power paradigms and, consequently, may be extremely inequitable in its results.

In the international arena, the influence of power has been evident in the very emergence of the idea of ecosystem services and the production and control of related knowledge (see Monfreda 2010, on TEEB). Similarly, the implicit focus of developed countries on the sustenance of regulating and supporting services—such as the Clean Development Mechanism (CDM) focusing on carbon emissions, or protected areas focusing on exclusive conservation (Colchester 2003)—has often occurred at the cost of attention to provisioning services that usually accrue to poorer communities, a reflection of the play of financial and political power in international and national policy-making. Given that higher-income communities may value regulating and supporting services more, any economic valuation will carry forward this bias, under-representing the provisioning services valued by the poorer communities. Such valuations consequently could feed into the creation of regressive policies.

As mentioned earlier, one justification for monetisation of ecosystem services has been the ease of comprehension amongst policy makers or laypersons, thereby enabling interventions to protect and ensure the sustenance of these services. However, monetisation may have counterproductive consequences when a 'polluter/forest-feller pays' mode leads only to a post facto justification of a problem, where polluters or users of ecosystem services simply pay for the services used or dis-services generated, in the belief that it suffices and justifies their access to, and exploitation of, the ecosystem service. Monetary valuation, therefore, implicitly ignores issues of incommensurability and irreversibility of certain ecosystem services. Compensatory payment methods based on ecosystem valuations lull users into a false sense of vindication, justifying the over-exploitation of the ecosystem. The Compensatory Afforestation Fund Bill (2008) of the Government of India is an example of the above consequence of interpreting ecosystem services solely in terms of economic values for policy making. The bill advocated a net present value (NPV) approach to forests which were to be de-notified for purposes like mining or urban development. However, assigning NPV to forests fails to capture the multiple (downstream and on-site) services that forests render, overlooking various non-monetary values such as religious and cultural values attached to forests. In fact, assigning monetary values may justify an increased de-notification of forests (Krishnan and Purushothaman 2008). Moreover, local communities that are crucially dependent on forests and important stakeholders of these ecosystems may be overlooked as the government may use such funds to develop its own corpus. Such lump-sum values ignore distributional impacts and hide the underlying relationship between ecosystems and their multiple stakeholders located across different spatial scales (Hein et al. 2006). Therefore, in many environmental disputes, monetisation aimed at resolving a conflict in the use of ecosystem services may, in fact, lead to the perpetuation of the conflict (Martínez-Alier 2002).

Linked to this is the growing concern that marketing and 'commodifying' ecosystem services (Kosoy and Corbera 2010) and putting price tags can exacerbate the growing rift between nature and human society. Environmental economics may argue that integrating ecosystem services into a mainstream market mechanism can potentially bridge the metaphorical 'rift' or 'dissociation' between humans and nature. However, monetisation may lead to aggravating the progressive dissociation of human activities from the natural systems. The obsession with pragmatism and the ease of interpretation that justifies the use of money metrics in valuation also result in the neglect of alternate approaches. It is precisely this search for alternatives which serves as the entry point for this set of articles.

INTRODUCING THE SPECIAL SECTION

The articles in this special section present insights into the history and practice of the idea of ecosystem services as well as recent advances. Further, the articles argue for, and illustrate the potential of, alternative frameworks. In the first article, Rodríguez-Labajos and Martínez-Alier distinguish between,

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and illustrate using several examples, three approaches to valuation—a strict economic valuation approach using monetary instruments, a flexible approach which need not always involve economic valuation, and a plural approach that takes into account non-chrematistic cultural and livelihood values. While chrematistic valuation might enhance the social visibility of biodiversity, such as in the 'GDP of the poor' exercise in TEEB, it might diminish visibility of other attributes—environmental, social, and cultural values—that are usually manifest in 'environmentalism of the poor'. The authors call for greater attention to specific problem contexts and instances to decide which of the three methods is appropriate and relevant, rather than uncritically accepting monetary valuation as the conservation movement seems to do at present.

Lele et al. provide a critical analysis of the idea and applications of ecosystem services, drawing from an extensive review of biophysical and socio-economic literature. Tracing the various versions of the concept, the authors note that it has become acceptable to both conservation biologists and environmental economists, fostering collaboration between them. However, it is not clear in the current discourse whether biodiversity is treated as one of the ecosystem services contributing to human well-being or as the foundation of all ecosystem services. There has been inadequate attention to the negative aspects of nature-society relationship, or 'dis-services'. Further, the neoclassical economics approach seems to have been uncritically applied to the ecosystem services literature, as in the case of economic valuation, resulting in highly reductionist analyses about changes in societal well-being. The authors call for an alternative problem framing that takes multiple explanations into account and outline this with an example of an ongoing study in eastern Indian forests.

Adhikari and Agrawal provide an extensive survey of the application of economic instruments in assessing and managing ecosystem services, focusing on PES. Using a meta-analysis of 26 case studies on applications of PES from 11 countries in Asia and Latin America, the article evaluates PES programmes based on four outcome dimensions—equity, participation, livelihoods, and environmental sustainability. The results, particularly with respect to equity and livelihoods, substantiate some of the points that we characterised earlier in this article as 'undesirable outcomes' of relying solely on monetary instruments.

The final article by Ghosh and Uddhammar illustrates that harvesting the recreational benefits of ecosystem services (in this case tourism) need not always present trade-offs between conservation and livelihoods, as usually posited, taking the case of protected areas in Serengeti National Park and the Ngorongoro Conservation Area in northern Tanzania, and the Corbett National Park in northern India. The authors resort to 'stages of progress', a participatory methodology pioneered by Krishna et al. (2004), to derive contextualised definitions of development. Without embarking on a valuation endeavour as would typically be done, the study concludes that conservation, livelihoods, and community-based tourism could go hand in hand. The article presents indicative and evolving work on different ways of assessing ecosystem services, taking into account contextually relevant social and institutional factors in addition to economic ones.

To sum up, though the limitations of a unidimensional monetary metric are acknowledged and recognised (Farber et al. 2002; Martínez-Alier 2002), the idea of ecosystem services and its applications seem to still centre overwhelmingly on monetisation and economic instruments. Taken together, the four articles in this special section cover the broad aspects of a discourse that we hope to set in motion in academic and policy circles on using ecosystem services as a framework and monetisation as a tool. Rodríguez-Labajos and Martínez-Alier critically reflect on the idea and practice of monetary valuation in regional and global instances; Lele et al. question the robustness of the ecosystem services framework and suggest alternatives; Adhikari and Agrawal illustrate some of the critical points raised in the first two articles; and Ghosh and Uddhammar present a case where a non money-metric approach was applied to evaluate diverse use of natural areas. These articles will complement ongoing debates on the complexities of conceptualising and assessing ecosystem services (Muradian et al. 2010), and provide critical insights into the relevance of alternative approaches.

NOTES

1. See http://www.teebweb.org/. Accessed on June 27, 2012.
2. See http://www.ipbes.net/. Accessed on June 27, 2012. Also see Larigauderie and Mooney 2010.
3. See http://www.un-redd.org/ for details on the Reducing Emissions from Deforestation and forest Degradation (REDD) and REDD+ initiatives of the United Nations. Accessed on June 27, 2012.
4. http://webarchive.nationalarchives.gov.uk/+/http:/www.hm-treasury.gov.uk/sternreview_index.htm. Accessed on June 27, 2012.
5. To take an example from environmental economics and policy itself, pollution taxes conceptualised in the 1920s by Pigou came to be applied in policies only several decades later.
6. For further details, see the Report of the Expert Committee on Net Present Value (Professor Kanchan Chopra Committee), 2006, available at http://www.iegindia.org/npvreport.pdf. Accessed on June 27, 2012.

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