

## PUBLICATION INFORMATION

This is the author's version of a work that was accepted for publication in Proceedings of the National Academy of Sciences (PNAS) journal. Changes resulting from the publishing process, such as peer review, editing, corrections, structural formatting, and other quality control mechanisms may not be reflected in this document. Changes may have been made to this work since it was submitted for publication. A definitive version was subsequently published in <http://dx.doi.org/10.1073/pnas.1514893112>

Digital reproduction on this site is provided to CIFOR staff and other researchers who visit this site for research consultation and scholarly purposes. Further distribution and/or any further use of the works from this site is strictly forbidden without the permission of Proceedings of the National Academy of Sciences (PNAS) journal.

You may download, copy and distribute this manuscript for non-commercial purposes. Your license is limited by the following restrictions:

1. The integrity of the work and identification of the author, copyright owner and publisher must be preserved in any copy.
2. You must attribute this manuscript in the following format:

This is a submitted version of an article by *Jacob Phelps, Carol Adaire Jones, John A. Pendergrass, Erik Gómez-Baggethun*. 2015. **Environmental liability: A missing use for ecosystem services valuation**. *Proceedings of the National Academy of Sciences (PNAS)*. 112 (39): E5379.  
DOI: <http://dx.doi.org/10.1073/pnas.1514893112>



## Letter to Editor, *PNAS*

A "missing" use for ecosystem services concepts

Jacob Phelps<sup>a</sup>, Carol Adaire Jones<sup>b</sup>, John A. Pendergrass<sup>b</sup>, Erik Gómez-Baggethun<sup>c, d</sup>

<sup>a</sup> Center for International Forestry Research (CIFOR), Jalan CIFOR, Situ Gede, Bogor Barat 16110, Indonesia

<sup>b</sup> Environmental Law Institute, 1730 M Street, NW Suite 700, Washington, DC 20036

<sup>c</sup> Norwegian Institute for Nature Research (NINA), Gaustadalléen 21, 0349 Oslo, Norway

<sup>d</sup> Environmental Change Institute, University of Oxford, Oxford OX1 3QY, United Kingdom

The Proceedings' 100th Anniversary special feature on natural capital and ecosystem services highlighted a range of opportunities and challenges to operationalizing these concepts to strengthen environmental governance (1). Yet, it largely overlooked the role that these concepts play in informing courtroom liability suits for environmental damages. Liability provisions are based on the "polluter pays" principle, and hold perpetrators financially responsible for environmental damages. They concern damage or reparation costs that do not appear in company balance sheets (hence neither in macro-economic accounts), unless they are claimed by the potential creditors through court cases, or unless there are state regulations that internalize environmental damages. We believe this omission reflects an important gap in mainstream, contemporary thinking about the role of ecosystem services and natural capital accounting.

Service quantification and valuation are increasingly associated with efforts to implement payments for ecosystem services schemes, raise awareness about environmental benefits, and enable trade-off analysis and priority setting for improved decision-making. The importance of service quantification and valuation to measuring damages for legal liability suits is much less frequently discussed. It remains largely absent from leading ecosystem service initiatives such as the Millennium Ecosystem Assessment, World Bank's Wealth Accounting and the Valuation of Ecosystem Services (WAVES) Programme, and The Economics of Ecosystems and Biodiversity.

Liability for environmental harm serves both important deterrence and corrective justice roles: it increases the financial and non-financial burdens of rule-breaking in ways that can disincentivize future environmental harm, while also compensating victims and securing resources for environmental restoration (2,3). Such liability cases exemplify how natural capital concepts can be leveraged to both improve the environment *and* address environmental justice concerns (4,5).

In addition to the many topics featured by the *PNAS* Special Feature, the increased, thoughtful use of ecosystem service valuation to inform environmental suits should also be highlighted as a promising, under-utilized opportunity to effect "large-scale transformative change" (1, Table 1), by holding responsible parties more accountable for their actions, and by placing environmental justice at the center of decision-making.

References:

1. Guerry AD, et al. (2015) Natural capital and ecosystem services informing decisions: From promise to practice. *Proc Natl Acad Sci USA* 112:7348-7355.
2. Cohen MA (1992) Environmental crime and punishment: Legal/economic theory and empirical evidence on enforcement of federal environmental statutes. *J Crim L & Crim* 82:1058-60
3. Abelkop ADK (2013) Tort law as an environmental policy instrument. *Or L Rev* 92:391-427.
4. Jones CA (2000). Economic valuation of resource injuries in natural resource liability suits. *J Water Resour Plann Manage* 126:358-365.
5. Greyl L, Ojo GU (Eds) (2013) Digging deep corporate liability: Environmental justice strategies in the world of oil. *EJOLT Report* 9.