

## **Economic valuation and environmental justice: Are they compatible?**

Erik Gomez-Baggethun<sup>1</sup>, Arild Vatn<sup>1</sup>

<sup>1</sup>*Norwegian University of Life Sciences (NMBU), Department of International Environment and Development / Noragric, Ås, NORWAY*

Economic development bears unaccounted social and environmental costs (e.g. ecosystem service decline, health impacts, and biodiversity loss) that rarely appear in company balance sheets or macroeconomic accounts, unless they are claimed through courts or unless state regulations mandate their internalization. While attention to valuation of the 'hidden costs' of development has grown steadily in recent decades, the way in which these costs should be framed, valued and dealt with in environmental governance remains a source of controversy. While many economists see economic valuation and market-based instruments as the most powerful mechanisms to deal with the problem, critical scholars often taken distance from economic valuation on the grounds that it privileges access to those with ability to pay. Are economic valuation and environmental justice mutually excluding? Using the example of ecosystem services, this paper addresses the question of whether economic valuation of socio-environmental costs is compatible with environmental justice goals. The paper is organized in three main parts, respectively addressing the problems of framing, valuation and governance of socioenvironmental costs. Part one describes the 'externality approach' and the 'cost-shifting approach' as competing frameworks to conceptualize the problem of unaccounted costs. The first framework describes socio-environmental costs as externalities resulting from 'market failures', calling for their internalization in the price system through monetization and market-based instruments. This latter approach builds on the body of literature in institutional and ecological economics that (following William Kapp) describes socio-environmental costs as 'cost-shifting successes' through which powerful actors capitalize the benefits of their economic activity while imposing costs on others, including other species, future generations, and the poor. Part two draws examines how the two analytical frameworks describe above confront the question of how socioenvironmental costs are to be measured and valued. In doing so, the perspective that all of these costs can be effectively monetized is confronted with that on integrated valuation approaches that acknowledge incommensurability and value pluralism. Finally, part three addresses the problem of how socio-environmental costs elicited through valuation can be articulated through institutions and regulatory frameworks. The case that externalities are to be seen as market failures to be internalized through market-based instruments is contrasted with the case that capacity to degrade social and environmental conditions at zero cost, does not reflect a market failure as much as a power asymmetry that allow certain economic actors to impose costs on others, and the thesis that social struggle can be an effective driver of cost internalization.

We claim that ecosystem service valuation can inform liability claims for socio-environmental damage relying on justice-based institutions such as civil or criminal legislation on socio-environmental liabilities. We note that informing liability suits is a promising and yet underexploited application of ecosystem services valuation, and we point to concepts, frameworks and methods that allow shifting the spotlight of economic valuation efforts from 'getting prices right' to 'getting justice right'.

## **On the emergy accounting of intangible goods**

Francesco Gonella<sup>1</sup>, Silvio Cristiano<sup>2</sup>, Sofia Spagnolo<sup>3</sup>, Sergio Ulgiati<sup>4,5</sup>

<sup>1</sup>*Ca' Foscari University of Venice, Italy, Venezia, ITALY*; <sup>2</sup>*IUAV University of Venice, Italy, Venice, ITALY*; <sup>3</sup>*Ca' Foscari University of Venice, Italy, Venice, ITALY*; <sup>4</sup>*Parthenope University of Napoli, Naples, ITALY*; <sup>5</sup>*Beijing Normal University, Beijing, CHINA*

Sustainability and equitable use of the resources require a proper evaluation of all their flows in the complex network of relationships ensuring systems functioning, resilience and dynamics. Monetary evaluations alone are framed within a user-side perspective that hardly captures the

complex role played by the natural capital and by the intangible goods. On the other hand, the donor-side perspective which the Emergy Accounting is based on provides a measure of values that accounts for all the investment done in generating services and resources at a more exhaustive scale than those addressed by economic analyses, opening the possibility of evaluating the contribution to the systemic operation of intangible aspects otherwise neglected by many "traditional" analysis methodologies. In this paper, the problem of accounting of intangible goods in emergy analysis is addressed. The systemic role of "stocks" of image and reputation is described for some case studies systems, pointing out how their quantitative determination is needed in the description of the systems operation for a comprehensive evaluation of their sustainability. In particular, we discuss the contribution given by the image of a system in the case of a productive sector and for an higher education system. As for the former case study, we address the sustainability of the renowned artistic glass sector of Murano island, in the Venice Lagoon (Italy), which has been challenged in recent years by the evolution of several socio-economic dynamics as well as by environmental constraints. A renewal of the systemic structure of the artistic glass production is linked to a proper management of the products image, an image which in turn depends on that of the entire city of Venice, underlining how the sustainability of the sector is part of that of Venice and its lagoon.

As concerns the second example, the image and reputation of a public University is addressed as a key factor affecting both the recruitment of qualified faculty and the enrollment of students, as well as the capability of attracting financial support from privates and through the participation in joint projects. Actually, the University -both as a physical system and as an Institution- pursues operational strategies that are ultimately based on market-related issues. For example, the competitive academic environment draws a particular attention to the prestige given by a sustainable University, making its reputation a key concept in maintaining its competitiveness. In this sense, from a systemic point of view, sustainability and image become strictly correlated concepts.

## **Sustainable Futures in Tropical Landscapes: An Integrated Agent-Based Modelling Approach**

Julen Gonzalez-Redin<sup>1</sup>, Iain J. Gordon<sup>2</sup>, Rosemary Hill<sup>3</sup>, Gary J. Polhill<sup>1</sup>, Terence P. Dawson<sup>4</sup>

<sup>1</sup>The James Hutton Institute, Information and Computational Sciences, Aberdeen, UNITED KINGDOM; <sup>2</sup>James Cook University, Division of Tropical Environments & Societies, Townsville, AUSTRALIA; <sup>3</sup>Commonwealth Scientific and Industrial Research Organisation (CSIRO), Land & Water, Cairns, AUSTRALIA; <sup>4</sup>King's College London, Department of Geography, London, UNITED KINGDOM

### Summary

Tropical landscapes lie at the nexus of three highly pressing concerns for a globally sustainable future: biodiversity conservation, climate change mitigation, and food production. This trade-off presented by tropical landscapes to society varies across countries; for instance, environmental management in the Wet Tropics Natural Resource Management (WET NRM) Region in Queensland, Australia, is progressing from single-purpose concerns –logging and land clearing for agriculture- towards multifunctional landscape governance approaches focused on addressing ecosystem services (ES) trade-offs (Stork et al., 2011). Furthermore, the number of protected (PA) areas in this region has increased in twenty percent since 1999 influenced by the inscription of the WET NRM Region on the World Heritage List (DSITI, 2016). This particular context has created a solid conservation-focused governance framework supported by different society sectors and agents at different scales. With this in mind, we develop an integrated and spatially explicit Agent-based model (ABM) to explore the extent three different future land-use scenarios (b.a.u., land-sparing, land-sharing) would affect landscape sustainability in the WET NRM region. In particular, our ABM incorporates Bayesian belief networks, GIS, empirical data and expert knowledge to study the impact of different landscape configurations on trade-offs and bundles regarding biodiversity, sugarcane production and carbon sequestration indicators. Model scenarios are computed under the land-sharing (LSH) vs. land-sparing