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A New Mechanism for Science-Policy Transfer and Biodiversity Governance?

by Jorge Soberón

2010

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Soberón, J. 2010. A New Mechanism for Science-Policy Transfer and Biodiversity Governance? Environmental Conservation 36(4): 265-267.

Published version: http://dx.doi.org/10.1017/S0376892910000226

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COMMENT

A new mechanism for science-policy transfer and biodiversity governance?

We are concerned that new initiatives are being proposed to create knowledge-transfer mechanisms between biodiversity science and so-called 'decision makers' that are apparently ignoring some of the significant differences to which biodiversity governance is subject at different scales. Here we argue that shifting scales seriously change the rules of knowledge transfer, explore some implications of this, and propose that appropriate scope and focus are vital for such international initiatives.

It is well known that the different components, structures and processes that constitute biological diversity change and play different roles when the spatial-temporal scales (extent and resolution) of focus vary (Wiens 1989; Levin 1992; Storch et al. 2007). Less well appreciated is that different aspects of human interaction with biodiversity, including its governance, also vary with the spatial scale under consideration (Swanson 1997; Berkes 2004; Soberón 2004; Folke et al. 2005; Ludwig & Stafford Smith 2005; Cumming et al. 2006). In the international biodiversity fora especially, the global is often treated as if it were the only, or most important, scale. Although lip service is always paid to the need to include stakeholders at levels below the global (i.e. regional, national or local), the practical implications of doing so, for instance considering cultural and political differences among stakeholders, or the pervasive absence of high-quality information at national and sub-national scales, and the very significant costs of addressing these, are usually ignored. Almost every reference to biodiversity governance issues can, and should, be disaggregated to take into account the specificities of the different scales. After many years attending meetings of the Convention on Biological Diversity (CBD) and other international groups involved in biodiversity governance, we are convinced that such disaggregation is seldom attempted, thus creating 'scale mismatch' (Ludwig & Stafford Smith 2005; Cumming et al. 2006), because what appears relevant at the global level in biodiversity governance is, in practice, treated as if it were relevant to every other level. A global view is obviously indispensable in environmental governance. The problem we perceive occurs when, in any of the global-scale initiatives, scale-shifting is addressed without explicit mention of the many serious complications and hurdles that such shifts imply for governance closer to the local levels.

The issue deserves attention because new initiatives towards strengthening biodiversity knowledge-transfer are being proposed (Loreau *et al.* 2006), a Concept Note for an Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IpBes; see URL http://www.ipbes.net/en/index.aspx) having been discussed at meetings in

Malaysia (November 2008) and Nairobi (October 2009). These meetings were followed by publication of the documents UNEP/GC/INF/30 and UNEP/IPBES/2/3 (see URL http://www.ipbes.net for more information). In our view, much of this process suffers from scale mismatch. For instance, the Report Document of the Nairobi meeting still considers [24(a)(i)] that a function for the IpBes platform would be: 'Identifying and prioritizing key scientific information needed for policymakers at various spatial scales', and 24(b) 'Coordinating and performing regular and timely assessments to generate and disseminate policy-relevant... information'. However, in biodiversity (in contrast with climate change), recommendations of an international panel of experts would seldom achieve the degree of detail required to become relevant at subnational levels. For example, in Mexico, at national and subnational scales, policy-relevant cartography for mangrove management required resolutions of at least 1:50 000, unavailable in any of the many global institutions interested in mangroves (see URL http://www.conabio.gob.mx/ conocimiento/manglares/doctos/manglares.html). Such information had to be produced afresh in Mexico. It is easy to provide many examples of how scientifically valid generalities lack the myriad of details that would make them truly relevant at scales towards the local. However, a new biodiversity science international platform that would provide advice to globallevel actors, for global policies, could indeed become useful at that level. Explicitly concentrating its focus at the global level would be less likely to elicit false expectations or negative reactions, and overall, have higher probability of success.

Shifting stakeholders

The core of our argument is that shifting the scale almost always means changing the stakeholders. This should be 'the first law of biodiversity governance'. It is easy to identify extremes: one lies at the level of multilateral environmental agreements, the funding bodies including overseas aid agencies, multilateral development banks, the big non-governmental organizations, and so on. The other extreme is at the level and scale of local decision-makers, such as farmers, ranchers, forest dwellers, fishers, indigenous and peasant communities, mostly in the developing world, but also to a significant extent in the industrialized countries. There are many levels in between (for example see Schultz et al. 2007). These stakeholders differ at the very least in the sets of values (Gadgil 1995; Bawa & Gadgil 2003), in the languages and vocabularies (Maffi 2005; Walsh 2005), and knowledge systems (Agrawal 1995; Chambers & Gillespie 2000; Toledo 2001) that they use in order to represent, understand and predict features of the natural environment in which they live, and in the processes they use to build trust and reach agreements (Herlihy & Leake 1997; Becker & Ghimire 2003; Folke *et al.* 2005). Moreover, towards the local levels, ecological problems become dominated by the details of local context, making general recommendations less useful. Unless donors or governments are prepared to cover the huge costs of obtaining the non-existent data (Smith & Klopper 2002; Balmford *et al.* 2005), an international panel can only try to extrapolate from known studies, mostly in the industrialized world, and from theory. This would be hardly convincing for people taking decisions in developing countries.

In view of the above, 'international, peer-reviewed' scientific advice cannot be 'policy-relevant at all levels' as some documents claim (UNEP [United Nations Environment Programme] 2009). Moreover, when decision-making moves towards the local levels, knowledge is very often turned into choices and decisions, not by being 'translated', but by being developed in a participatory way by relevant stakeholders. Often, this participatory process is what gives legitimacy and saliency (Cash et al. 2003) to knowledge, and the everyday process of managing natural resources requires not a single event of translation of knowledge, but a complicated adaptive process that implies multiple actors playing different roles at different scales for long periods of time (Folke et al. 2005). Of course, the transaction cost of such participatory processes is high, but in the longer run it may be lower than the enormous costs of total failure owing to lack of saliency, legitimacy and acceptability.

For all the above reasons, to avoid the scaling mismatch, new initiatives need to adjust their focus. The natural audience for a new international panel would be decision makers at the global level. Global actors may be prepared to listen to technical and global political arguments without the need to enter into complicated and local processes to establish credibility and legitimacy. Moreover, some of the most powerful drivers of biodiversity loss are global in nature, even having already policy-making bodies (the boards of the major agro-industrial companies, the groups managing the major fishing fleets, the major development agencies and the council of the Global Environment Facility, perhaps via its own Scientific and Technical Advisory Panel). We propose that a new biodiversity science advisory body can be extremely relevant at this global scale, but its impact and the pertinence of its advice will weaken towards the local levels. Such a body may also highlight global research and information gaps.

At national levels, the only long-term solution is that national governments take their responsibilities seriously and countries build their own local capacity and expertise through institutions oriented to deal with the problems of biodiversity information gathering, its translation to the languages and terms of stakeholders, and its distribution across levels. The capacity to 'move between levels' is crucial, and although it may be played by key individuals, only institutions can

perform this role over extended periods of time. These institutions are called 'border institutions' (Cash *et al.* 2003) or 'bridging organizations' (Folke *et al.* 2005) and examples in the developing world exist (CONABIO [the Mexican National Commission on Biodiversity], InBio [National Biodiversity Institute of Costa Rica], SANBI [South African National Biodiversity Institute] and the von Humboldt Institute in Colombia, to mention some). We strongly believe that there is no substitute for the full development of such local capacities, and we have no doubt that the multinational lending agencies interested in the conservation of biodiversity, the achievement of the Millennium Development Goals, and others should support such national efforts and establish regional training facilities to help generate the human and basic institutional capacities needed.

Acknowledgements

We thank many colleagues with whom we have shared long biodiversity meetings. Hesiquio Benítez helpfully commented on the manuscript. This work was partially supported by the Mexican National Commission on Biodiversity (CONABIO), but the opinions expressed are not the official position of CONABIO or the Mexican Government.

References

Agrawal, A. (1995) Dismantling the divide between indigenous and scientific knowledge. *Development and Change* 26: 413–439.

Balmford, A., Crane, P., Dobson, A., Green, R.E. & Mace, G. (2005) The 2010 challenge: data availability, information needs and extraterrestrial insights. *Philosophical Transactions of the Royal* Society B 360: 221–228.

Bawa, K.S. & Gadgil, M. (2003) Ecosystem services in subsistence economies and conservation of biodiversity. In: *Nature's Services*. *Social Dependence on Natural Ecosystems*, ed. G. C. Daily, pp. 295–310. Washington, DC, USA: Island Press.

Becker, D.C. & Ghimire, K. (2003) Synergy between traditional knowledge and conservation science supports forest preservation in Ecuador. *Conservation Ecology* 8(1): [www.document]. URL http://www.ecologyandsociety.org/vol8/iss1/

Berkes, F. (2004) Rethinking community-based conservation. Conservation Biology 18(3): 621–630.

Cash, D.W., Clark, W.C., Alcock, F., Dickson, N.M., Eckley, N., Guston, D.H., Jager, J. & Mitchell, R.B. (2003) Science and technology for sustainable development special feature: knowledge systems for sustainable development. *Proceedings of the National Academy of Sciences USA* 100(14): 8086–8091.

Chambers, D.W. & Gillespie, R. (2000) Locality in the history of science: colonial science, technoscience and indigenous knowledge. *Osiris* 15 (2nd series): 221–240.

Cumming, G.S., Cumming, D.H.M. & Redman, C. (2006) Scale mismatches in social-ecological systems: causes, consequences, and solutions. *Ecology and Society* 11(1): 14–33.

Folke, C., Hahn, T., Olsson, P. & Norberg, J. (2005) Adaptive governance of social-ecological systems. Annual Review of Environmental Resources 30: 441–473.

Gadgil, M. (1995) Prudence and profligacy: a human ecological perspective. In: The Economics and Ecology of Biodiversity Decline,

- ed. T. Swanson, pp. 99–110. Cambridge, UK: Cambridge University Press.
- Herlihy, P. & Leake, A.P. (1997) Participatory research mapping of indigenous lands in the Honduran Mosquitia. In: *Demographic Diversity and Change in the Central American Isthmus*, ed. A.R. Pebley & L. Rosero Bixby, pp. 707–736. Santa Monica, CA, USA: RAND.
- Levin, S.A. (1992) The problem of pattern and scale in ecology. *Ecology* 73(6): 1943–1967.
- Loreau, M., Oteng-Yeboah, A., Arroyo, M.T.K., Babin, D., Barbault, R., Donoghue, M., Gadgil, M., Hauser, C., Heip, C., Larigauderie, A., Ma, K., Mace, G., Mooney, H.A., Perrings, C., Raven, P., Sarukhán, J., Schei, P., Scholes, R.J. & Watson, R.T. (2006) Diversity without representation. *Nature* 442: 245–246.
- Ludwig, J. & Stafford Smith, M. (2005) Intrepreting and correcting cross-scale mismatches in resilience analysis: a procedure and examples from Australia's rangelands. *Ecology and Society* 10(2): 20–26.
- Maffi, L. (2005) Linguistic, cultural and biological diversity. Annual Review of Anthropology 29: 599–617.
- Schultz, L., Folke, C. & Olsson, P. (2007) Enhancing ecosytem management through social-ecological inventories: lessons from Kristianstads Vattenrike, Sweden. *Environmental Conservation* 34(2): 140–152.
- Smith, G.F. & Klopper, R. (2002) A southern perspective on the All Species project and the global taxonomy imperative. *Taxon* 51: 359–361
- Soberón, J. (2004) Translating life's diversity: can scientists and policymakers learn to communicate better? *Environment* **46**(7): 10–20.

- Storch, D., Marquet, P.A. & Brown, J.H. (2007) Scaling Biodiversity. Cambridge, UK: Cambridge University Press.
- Swanson, T. (1997) Global Action for Biodiversity. London, UK: Earthscan Publications.
- Toledo, V.M. (2001) Indigenous peoples, and biodiversity. In: Encyclopedia of Biodiversity, ed. S. Levin, pp. 1181–1203. San Diego, CA, USA: Academic Press.
- UNEP (2009) Preliminary gap analysis for the purpose of facilitating the discussions on how to strengthen the science-policy interface. UNEP/GC.25/INF30 [www document]. www.unep.org/gc/gcss-x/download.asp?ID=1010
- Walsh, M. (2005) Will indigenous languages survive? Annual Review of Anthropology 34: 293–315.
- Wiens, J. A. (1989) Spatial scaling in Ecology. Functional Ecology 3: 385–397.

JORGE M. SOBERON^{1,3*} AND JOSE K. SARUKHAN^{2,3}
¹ Biodiversity Research Center and Department of Ecology and
Evolutionary Biology, University of Kansas, Dyche Hall, 1345
Jayhawk Boulevard, Lawrence, Kansas 66045-7561, USA,
² Instituto de Ecología, Universidad Nacional Autónoma de
México, Apdo Postal 70-275, Ciudad Universitaria, 04510,
México, and ³ Comisión Nacional para el Conocimiento y Uso de
la Biodiversidad (CONABIO), Periférico-Insurgentes 4903,
Tlalpan 14010, México

^{*}Correspondence: Professor Jorge Soberon e-mail: jsoberon@ku edu