

What does policy-relevant global environmental knowledge do? The cases of climate and biodiversity

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There is a surge in global knowledge-making efforts to inform environmental governance. This article synthesises the current state of the art of social science scholarship about the generation and use of global environmental knowledge. We focus specifically on the issues of scale — providing globalized representations of the environment — and relevance — providing knowledge in a form that is considered usable for decision-making. Using the examples of the Intergovernmental Panel on Climate Change, the Intergovernmental Platform on Biodiversity and Ecosystem Services and the Millennium Assessment, the article discusses what policy relevant global knowledge does: how it represents the environment, and how this specific form of knowledge connects with governance and policy.

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The emergence of global environmental knowledge

International conventions and regimes in the environmental and sustainability domains have always relied heavily on scientific information. A high number of institutions and organizations are currently involved in providing state of the art knowledge and information on a global scale to inform negotiations and decision-making processes [1]. There are numerous examples related to biodiversity and climate, but also themes like desertification and microbial resistance are considered as candidates

for global assessments. This is not the place to explore the question of why or exactly how these assessments have come into existence for environmental and sustainability issues, but not for so many other international conventions and regimes. Yet this impetus for global knowledge assessment is telling of the largely technocratic and science-based character of environmental decision-making more generally.

Global environmental assessments have to meet a number of challenges. One of these is the issue of scale. Although the importance of the global level for policy making and implementation is increasingly questioned, it is still the working principle of most environmental assessments that global knowledge is what is needed for global environmental governance. Knowledge about specific localized places must be scaled-up to the global level, for example by using models or by integration with satellite based information. This process of scaling-up consists of multiple steps of translation during which fragments of knowledge get modified and gain new meanings. In the end, what is produced is a very specific form of knowledge: one that has become decontextualized and is suggestive of certain policy interventions [2–4]. In other words, global environmental knowledge is crucial for framing environmental change as a global problem and for finding solutions that are salient for global governance actors.

The second key challenge of global environmental knowledge is policy relevance. Generally speaking, global environmental knowledge is produced with the explicit aim of being in some way relevant for decision-making while remaining objective and neutral. The phrase that this knowledge should be policy relevant, yet policy neutral and not policy prescriptive has become somewhat of a mantra in various global environmental assessment initiatives [5]. The production of what is considered policy relevant knowledge involves a process of translation during which knowledge is repackaged using specific terms that are considered to be attractive for and speak to the needs of decision makers [6,7*].

This brief article draws on studies in critical political ecology, political science and governance studies, and science and technology studies to explore the effects of global policy relevant environmental knowledge. This focus on the effects of knowledge draws attention to the ways in which knowledge exercises a certain form of — epistemic — power [8], which affects not only how

we understand the environment but also, and at the same time, how we act upon this environment [9]. In other words, knowing and acting are dialectically related. Knowledge is therefore performative, which is to say that representing the environment at the same time constitutes it. This more pervasive form of power is implicated in all forms of knowledge production and goes beyond the question whether policy makers listen to what scientists have to say and implement their recommendations; indeed, most forms of environmental knowledge, and particularly global forms perhaps, are often not seen as very powerful in that more restrictive sense.

We focus on three of the most prominent examples of environmental assessments to illustrate our arguments: the Intergovernmental Panel on Climate Change (IPCC), the Millennium Assessment (MA), and the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES). There are important differences between these three: the MA was a single assessment commissioned by the Convention on Biological Diversity while the IPCC and IPBES are intergovernmental bodies that undertake — in the case of the IPCC — or plan to undertake — in the case of IPBES — multiple and repeated knowledge assessments. We have selected these three examples because they are well documented in the literature, because they explicitly aim to inform decision-making and governance, and because they vary in terms of the approach to assessment — including questions of scale and relevance — that they take or plan to take. We therefore expect that they will offer critical insight into the different implications of scaling and policy relevance for environmental knowledge and decision-making.

Globalizing the environment

Since the IPCC was created in 1988, the knowledge it has presented to the world has remained heavily framed by the paradigm of global climate modelling and Earth System Science [10]. Over five full knowledge assessment cycles, the IPCC has conceptualized climate first and foremost as ‘global’, indexed iconically through the global-mean surface air temperature. Although the IPCC has never formally debated and adopted a unifying conceptual framework — unlike IPBES [11] — its default position has been to approach climate as a single, interconnected, physical system. This entrenched view was re-expressed recently by Thomas Stocker, the outgoing Co-Chair of Working Group 1 (WG1) of the IPCC’s Fifth Assessment Report (AR5). Commenting on the possible structure of the future AR6 Stocker said:

‘Many other opinions and suggestions have been aired. Regionalization of IPCC assessments is sometimes called for to give policy-makers and practitioners more and better regional information. In our view, this approach would undermine *the global character of the climate-change*

problem exemplified by the IPCC’ [12] (p. 165, emphasis added).

This view of climate change as meaningful only in terms of its global character is one that the IPCC inherited and yet at the same time has helped to shape. Since the 1950s, the idea of ‘climate’ in western science evolved from being predominantly interpretative, and hence geographically differentiated, to becoming enumerated and hence readily globalized [13]. The era of satellites and computer models and a globally connected network of scientific institutions and practices enabled this new global construction of climate to prevail. Climates — plural and situated in places — became global climate, singular and placeless. Regional climatic variations became interpreted through the narrative of global climate change, while global climate became the entity to be predicted by the new Earth System science.

Although the IPCC assessments acknowledge the importance of regions — for example through incorporating regional climate models such as PRECIS [14**] and through the regional assessments of impacts in Working Group 2 — climate knowledge in the IPCC is still conditioned on the simulations of global climate models (GCMs; also Earth System Models). The flow of knowledge is one way (as too is causation [15*]): from the global to the regional and, occasionally, to the local. Similarly Working Group 3 of the IPCC — dealing with the mitigation of climate change — evaluates global-scale studies that analyse technological, economic and land use options for intervening to achieve global objectives, for example, managing global carbon budgets or global temperature. Indeed, the clearest example of the globalizing instinct of the IPCC’s climate knowledge assessment has been the reification of global temperature. This indexed quantity — whether constructed from thermometer measurements, calculated from satellite retrievals, reconstructed from proxies or modelled through computer code — has become central to the language of climate change. A particular notion of ‘epistemically-relevant’ science (i.e., climate and Earth System sciences) therefore becomes dominant in the IPCC, excluding other views of science — for example the knowledge of energy engineers or biotechnologists — as well as non-scientific knowledge systems.

Although in the case of climate, the global character of knowledge has become almost self-evident — greatly facilitated by the prominent use of GCMs and the notion of global temperature — this is arguably less so for biodiversity. No universally accepted standardized measures and metrics currently exist for the global assessment of biodiversity and there is much debate about the desirability of standardization of biodiversity knowledge. Drawing on an analogy with the IPCC’s

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