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Solution-oriented global environmental assessments: Opportunities and challenges

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ABSTRACT

This article provides an introduction to the Special Issue dedicated to "Solution-oriented Global Environmental Assessments: Opportunities and Challenges". In the follow-up to the Paris climate agreement and the adoption and early implementation of the global Sustainable Development Goals involving many synergies and trade-offs, the need to shift the focus from environmental problem analysis towards the exploration of specific solution options can be observed in international environmental governance debates. To remain policy-relevant, credible and legitimate, global environmental assessments (GEAs) must carefully adapt to a rapidly evolving governance landscape. This Special Issue sheds light on the potential utility and implications of increased solution-orientation of GEAs. It builds on the research project "The Future of Global Environmental Assessment Making" that was jointly initiated in 2013 by UN Environment and the Mercator Research Institute on Global Commons and Climate Change. The article collection includes research on the coevolution of GEAs and the increasingly solution-oriented governance context; conditions of success for contemporary GEAs; the treatment of divergent viewpoints, stakes and stakeholders in solution-oriented GEAs; knowledge aggregation; and the enhanced measurement of GEA effectiveness in the emerging governance landscape.

1. How GEAs coevolve with policy context toward a solution orientation

This Special Issue of Environmental Science & Policy has its origins in an interdisciplinary and transdisciplinary collaborative research project The Future of Global Environmental Assessment Making (FOGEAM),[1] initiated in 2013 by UN Environment (UNEP) and the Mercator Research Institute on Global Commons and Climate Change (MCC). The project sought to explore global environmental assessments (GEAs) in the context of the emerging landscape of international environmental governance that focuses on solutions, and thus to inform future GEA design discussions among different stakeholders. Adopting a comparatively broad scope, FOGEAM aimed to enhance understanding of contemporary GEAs and their contexts, the value but also the risks of an increasing emphasis on solution options in GEAs, as well as related options and challenges for GEA processes and design. This Special Issue of Environmental Science & Policy comprises 10 contributions that present results of FOGEAM's body of work and of further investigations into the inherent and unexpected challenges and opportunities of solution-oriented GEAs.

Nearly 40 years ago, the Organisation for Economic Co-operation and Development (OECD) embarked on a highly-collaborative international scientific investigation of transboundary air pollution. Motivated by the need to systematically build transnational consensus among Western European policymakers, the process resulted in a seminal publication the OECD Assessment of Long-Range Transport of Air Pollutants (LRTAP) - confirming the notions that pollutants are transported over long distances and that air quality in each country is measurably affected by pollution from surrounding countries (OECD, 1977). The LRTAP assessment spearheaded important policy on acid rain issues far beyond Western Europe (Cowling, 1982). The production and uptake of this unique and new form of scientific output marked an important breakthrough for evidence-based decision making (Alexander and Jäger, 2006). Crucially, the LRTAP process, and its subsequent multilateral efforts, provided the genesis of the global environmental assessment enterprise. In the intervening years, 143 distinct GEAs have been initiated and 136 completed and published (Jabbour and Flachsland, 2017).

GEAs can be understood as large-scale social processes where large groups of experts convene to interpret, deliberate and synthesize existing scientific knowledge on complex environmental issues with a view to inform public policy (Mitchell et al., 2006; Kowarsch et al., 2016). Prominent examples include both recurring and irregular processes—often carried out by intergovernmental agencies or independent bodies established through multilateral regimes. These processes include UNEP's Global Environment Outlook (GEO) series (e.g., Ullstein et al., 2012), the periodic assessments of the Intergovernmental Panel on Climate Change (IPCC) (e.g., IPCC, 2013), the Global Biodiversity Outlook (e.g., CBD, 2014), the

[1] For more information, see http://www.mcc-berlin.net/en/research/cooperation/unep.html. The MCC is an independent social-science research institute in the field of sustainability located in Berlin.

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Millennium Ecosystem Assessment (e.g., MA, 2003), the International Assessment of Agricultural Science and Technology for Development (e.g., McIntyre et al., 2009) and thematic assessments of the International Resource Panel (e.g., UNEP, 2017) and of the Intergovernmental Platform on Biodiversity and Ecosystem Services (e.g., Larigauderie, 2015).

Over the past four decades, GEAs have evolved to become arguably the most elaborate, systematic, and formally structured dimension of the science-policy-society interface (Kowarsch, 2016a; Jabbour and Hunsberger, 2014). GEAs represent a unique and powerful collective enterprise for mobilizing scientific information through a deliberative, collaborative, and international social process. With other external factors influencing the policy process, GEAs have provoked and even shaped international negotiations (Riousset et al., 2017; Mitchell et al., 2006; Watson, 2013; Jabbour and Flachsland, 2017). For example, the stratospheric ozone assessments provided the scientific, economic and technical basis for the Montreal Protocol; the IPCC assessments effectively informed years of policy debate, research agendas, and civil society campaigns culminating in the Paris Agreement on climate change (Kowarsch et al., 2016); and the fifth Global Environment Outlook (GEO-5) influenced the post-2015 development agenda (Dodds et al., 2014; Rowe et al., 2014).

The GEA enterprise, and the coevolving international environmental governance context in which assessment processes are embedded, have changed significantly since the mid-1970s when GEAs originated, and a high diversity of GEAs have proliferated since then. Many contemporary GEAs are conducted in a wider context of the international agenda on sustainability and the governance system for the global commons, where the natural environment is increasingly recognized not only as an equal but as an indispensable dimension of sustainable development (Jabbour et al., 2012). This thinking is a significant departure from the dominant international discourse around LRTAP.

More specifically, the 2015 Paris Agreement and the adoption and early implementation of the Sustainable Development Goals (SDGs) both involve a complex suite of policy interactions and trade-offs. The aspirations and commitments articulated in these agreements mark a significant milestone in international cooperation that in and of itself is an essential element for the required course-correction. However, these agreements are about targets and not explicit mechanisms or a codification for international, regional and/or national means of implementation. The challenge now is to ensure that the agreements are informed by a robust and scientifically rigorous analysis of potential choices such as an interdependent mix of financial resources; technology development and transfer; capacity-building; inclusive and equitable trading systems, including realistic and effective carbon pricing mechanisms; regional integration; and the establishment of enabling institutional and national policy conditions. The comprehensive consideration of these options and their interdependencies marks a notable shift from environmental problem analysis to exploration of specific solutions and synergistic response options in international environmental governance debates.

It is within this emerging narrative – and within the dynamically changing political context that GEAs are embedded – that contemporary assessments have been undergoing a transformational shift and reorienting toward a particular emphasis on exploration of solution options (Jabbour and Flachsland, 2017). In this emerging institutional and policy situation, both the analysis and potential utility of future GEAs takes on particular significance for solutions. As assessments have become an established feature of the international environmental policy landscape, decision-makers, practitioners and scholars are demanding more explicit focus on analyzing the suitability of specific response options and policy pathways that range from technologies and behavioral change to policies, such as regulatory measures or market-based instruments (Perrings et al., 2011; Carraro et al., 2015; Lee, 2015; Kowarsch et al., 2017a).

Specific opportunities related to public policy assessment in GEAs are to facilitate effective international policy coordination and to catalyze policy learning and policy diffusion across regions and stakeholder groups, thereby improving the quality of national and regional policymaking. Historically, policy specificity in GEAs has often been dominated by the need to maintain political neutrality while building consensual knowledge around aggregated impacts and the need for responses. Moreover, the organizing frameworks and approaches of those GEAs predating 1995, and to lesser extent those occurring before 2005, often tended to frame issues in less tractable ways, producing narratives and findings that were detached, more generalized and less conducive to action. Thus, while various GEAs have traditionally and effectively exposed environmental problems and drivers, the assessment of solutions has not reached its full potential (Miller et al., 2014; Kowarsch et al., 2017a). Recent progress on environmental multilateralism and international environmental cooperation reveal that expectations for scientific knowledge and technology, and their interaction with decision-making processes, have shifted considerably.

There is increasing awareness of the need for more improved integration across all spheres and domains of sustainability, both in governance and in GEAs. There is also an inclination to shift the focus in GEAs toward policy alternatives, practical consequences and plausible future pathways (Kowarsch, 2016b; Jabbour and Flachsland, 2017). The adoption and early implementation of the SDGs in particular suggest that a better understanding of the interactions, interdependencies and coevolutionary pathways required to achieve collective goals will lead to policy integration. The SDGs also reflect the reality that a more balanced and integrated approach cannot be isolated from the imperative to address social and environmental inequalities (Martinez and Mueller, 2015).

GEAs and the broader science-policy-society interface in which they are embedded have clearly reached a turning point (Jabbour et al., 2012; Kowarsch et al., 2017a). Even in their diversity, GEAs must continue to coevolve with international environmental governance as interest grows in solution options and as additional components emerge that inform the process (Mitchell et al., 2006; Norgaard, 2008; Perrings et al., 2011; Jabbo ur and Flachsland, 2017). GEA processes can improve their utility for bridging between scientific expertise and the policy-making process and, crucially, for including civil society as an essential element of that process. This coevolution may, however, also involve a number of considerable challenges for contemporary GEAs that might endanger their effectiveness. For example, challenges could relate to the complexity and inherent uncertainty of knowledge that needs to be considered for any serious policy assessment, as well as other complications that will multiply as objectives and expectations of GEAs increase (Jabbour and Flachsland, 2017; Minx et al., 2017). Further challenges involve the treatment of divergent viewpoints and (investment) interests relating to various solution options as well as the definition and measurement of GEA success and effectiveness in the emerging governance landscape (Kowarsch et al., 2017a). As has been argued elsewhere, these challenges can be conceptually linked with credibility, legitimacy and salience as widely accepted criteria for GEA effectiveness (Kowarsch et al., 2017a; Mitchell et al., 2006; van der Hel and Biermann, 2017). However, the deeper analysis of the challenges and interdependencies that is provided in this Special Issue shows that such criteria need to be specified - and that they need to be continuously adapted to the changing policy contexts in which GEAs are embedded (Jabbour and Flachsland, 2017; Haas, 2017; Riousset et al., 2017).

The contributions in this Special Issue shed light on some major implications of the emerging governance landscape for contemporary and future GEAs, particularly the opportunities and challenges of an often demanded and already observable solution-orientation. A more nuanced understanding of the implications of the coevolution of GEAs with their policy contexts is absolutely crucial for their success and effectiveness in the evolving, solution-oriented landscape of international environmental governance. Whether an increasing focus on solution options in GEAs is actually desirable from a societal perspective, and how GEAs would then have to be designed more precisely, depends on the implications of the