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The authority of science in sustainability governance: A structured comparison of six science institutions engaged with the Sustainable Development Goals

Sandra van der Hel*, Frank Biermann

Copernicus Institute of Sustainable Development, Utrecht University, The Netherlands

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ABSTRACT

Over the past decades, numerous science institutions have evolved around issues of global sustainability, aiming to inform and shape societal transformations towards sustainability. While these science-based initiatives seem to take on an ever growing active role in governance for sustainable development, the question arises how they can claim any political authority in the first place. We present here a structured comparison of six international science-based initiatives, all engaged in governance processes related to the recently established Sustainable Development Goals. We focus on the material and rhetorical strategies employed by these science institutions to acquire authority by fostering perceptions of salience, credibility and legitimacy among governance actors. We distinguish three modes of scientific authority: an *assessment-oriented mode* that combines a strategy of salience through integration, with credibility by formal mechanisms of review, and legitimacy through representation; an *advice-oriented mode*, which appeals to salience through the promise of independent and timely science advice, to credibility through the credentials of the scientists involved, and to legitimacy through formal recognition by governance actors; and a *solution-oriented mode*, with science institutions claiming relevance based on the promise to contribute to solutions for global sustainability, while credibility is sought by invoking support of the scientific community, and legitimacy through a strategy of participation. Based on this analysis, we provide a framework for reflection on the claims and strategies of science-based initiatives, and their role and responsibility in governance for sustainable development.

This article is part of a special issue on solution-oriented GEAs.

1. Introduction

Undoubtedly, scientists and science institutions have become highly active participants in global sustainability governance over the past decades. And yet, today's role of scientists and science institutions – notably in the 2012 United Nations Conference on Sustainable Development in Rio de Janeiro and the subsequent intergovernmental negotiations for the Sustainable Development Goals – is bigger in both quality of influence and quantity of representation than ever before (UN DESA, 2014). Numerous science institutions have become actively engaged in formulating the Sustainable Development Goals, and many will have a prominent role in monitoring and measuring the impact of the goals and seek to contribute to their implementation (Griggs et al., 2013; Lu et al., 2015; Lubchenco et al., 2015; Stafford-Smith, 2014; Biermann et al., 2017). Overall, many major science institutions seek to turn towards what has been termed "solution-oriented science engagement", that is, a way of operation that aims to contribute to solutions for global sustainability (Edenhofer and Kowarsch, 2015; Lee, 2015).

Yet, the current high participation and increasing role of scientists in global sustainability governance is also contested, and has given rise to criticism regarding the usefulness and effectiveness of science institutions. For that reason, science institutions and their managers today seek to carefully construct and safeguard their authority in political processes in order to be able to continue to play an active role in governance for sustainable development. In this paper, we embark from the assumption that to construct and safeguard this authority, science institutions will aim to strengthen the *salience*, *credibility* and *legitimacy* of their work (drawing on the well-established framework by Cash et al., 2003 and Mitchell et al., 2006). Salience is here defined as the perceived relevance of science institutions and the knowledge they provide; credibility as the perceived scientific adequacy of scientific products and arguments; and legitimacy as the perceived fairness of knowledge production and assessment, respecting divergent values, interests and believes (Cash et al., 2003).

* Corresponding author.
E-mail addresses: s.c.vanderhel@uu.nl (S. van der Hel), f.biermann@uu.nl (F. Biermann).

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There are, however, no simple formulas for constructing and safeguarding salience, credibility and legitimacy. Instead, institutions can seek to pursue these qualities in different ways, building on divergent strategies to claim authority in the crowded space of science engagement in governance for sustainable development. The first aim of this paper is hence to *elucidate the variant strategies that science institutions employ to foster perceptions of salience, credibility and legitimacy in governance for sustainability*. The framework that we develop based on this exercise contributes to the second aim of this paper – *to support reflection on the strategies for authority pursued by science institutions engaged in governance for sustainable development.*

For the purpose of this paper, we employ the broad concept of science institutions to include various forms of science-based initiatives operating at the interface between science and governance for sustainable development. This includes Global Environmental Assessments (GEAs) but also advisory bodies and other forms of science networks and platforms. It is important to point out that science institutions are diverse in their institutional design and the context in which they operate, and that these institutions themselves are typically complex, multi-layered entities. Nevertheless, the common focus of science institutions in governance for sustainable development on informing, monitoring and implementing the Sustainable Development Goals warrants a comparison on the ways in which authority is sought in this crowded space of science engagement.

Our paper proceeds as follows. In the next section, we briefly introduce the academic literature on salience, credibility and legitimacy – particularly in relation to the strategies that science institutions may pursue to achieve these attributes – and present our research design, which is based on a structured comparison of six international science-based initiatives engaged in formulating, implementing and monitoring the Sustainable Development Goals. In sections 3 to 5 we discuss the different strategies that science institutions pursue to enhance and safeguard perceptions of salience, credibility and legitimacy among governance actors. We then point out three overarching modes of engagement and conclude by providing a framework to support reflection on the various strategies and their implementation.

2. Understanding authority of science in governance for sustainable development

Over the past decades, global environmental assessments and other science networks and institutions have become an important part of the international governance landscape for sustainable development (Biermann, 2014; Gupta et al., 2012). Indeed, science institutions can be seen as a (potential) source of authority in global politics (Miller and Edwards, 2001). Yet, the authority of science in a dynamic political environment is to a large extent contested and negotiated, and crucially depends on the practical and rhetorical tools that scientists use to establish perceptions of relevance and trustworthiness among governance actors (Kunseler and Tuinstra, 2017; Lidskog and Löfmarck, 2015; Turnhout et al., 2007).

Scholars of environmental politics have identified perceived salience, credibility and legitimacy as prerequisites for receptiveness of governance actors for scientific institutions and the knowledge they provide (Cash et al., 2003; Mitchell et al., 2006). In parts of this literature, the term “effectiveness” is used as the dependent variable to assess the eventual influence of science institutions. We rather conceptualize the key impact as authority of science, which we see as fundamental for an effective role of science in governance. The attributes of salience, credibility and legitimacy have been applied to understand the influence of (Global) Environmental Assessments (Cash et al., 2003; Mitchell et al., 2006), as well as other institutions operating at the science-policy interface (e.g. Reinecke, 2015; Sarkki et al., 2014, 2015). In this paper, we assume that science institutions, implicitly or explicitly, will attempt to increase perceptions of salience, credibility and legitimacy in order to establish and maintain their authority among governance actors.

However, there are no simple avenues for fostering perceptions of salience, credibility and legitimacy (Keller, 2009; Miller and Edwards, 2001; Reinecke, 2015). Reinecke (2015), for instance, lists several rhetoric strategies and institutional mechanisms that are employed to pursue these qualities, including the translation of research findings into policy messages to enhance salience, formal procedures for assuring the quality of knowledge to safeguard credibility, and transparency of the initiative to foster perceptions of legitimacy. Other studies point to formalized rules of engagement as beneficial to salience and credibility (Keller, 2009), emphasize how scientists establish credibility by claiming membership of the broader scientific community (Keller, 2009; Lidskog and Löfmarck, 2015), and identify stakeholder participation as an increasingly popular strategy for generating salient, credible and legitimate science engagement (Kunseler et al., 2015; Sarkki et al., 2015; van Enst et al., 2016).

More broadly, salience, credibility and legitimacy mean different things in different socio-political and cultural contexts, making it difficult to secure these attributes among often highly diverse audiences (Biermann, 2002; Jasanoff, 2005). Moreover, science institutions may place different emphasis on the attributes of salience, credibility and legitimacy (Reinecke, 2015). Several studies have pointed to trade-offs between salience, credibility and legitimacy, and the balancing act for assuring these qualities accross different actors (Kunseler et al., 2015; Sarkki et al., 2014). Finally, science institutions have been shown to pursue different strategies across different sites or levels of the institution (Keller, 2009; Kunseler and Tuinstra, 2017).

Our study contributes to this literature by distilling common strategies pursued across different science institutions and by critically reflecting on the related claims for salience, credibility and legitimacy. We use here the broad concept of “strategies”, by which we include organizational strategies and institutional mechanisms – ranging from informal mechanism to formal rules and procedures – as well as rhetorical strategies (Keller, 2009; Reinecke, 2015). As discussed above, science engagement in governance for sustainable development is a complex phenomenon, and science institutions themselves are multi-layered entities. As such, we do not expect to find unequivocal strategies for pursuing perceptions of salience, credibility and legitimacy. Instead, we assume that science institutions apply a multitude of different claims, tools and mechanisms in pursuit of these qualities. These “strategies” might be implicit or explicit, actual or rhetoric, and in various degrees related to the institutional mandate or design. By using the broad concept of “strategy”, we aim to grasp the diversity of institutional, organizational and rhetorical instruments and mechanisms used to pursue authority.

The paper draws on a structured comparison of six science-based initiatives engaged in governance for sustainable development. These six science institutions work according to different logics of operation, yet share the goal of contributing scientific knowledge and expertise to the development and implementation of the Sustainable Development Goals, agreed upon in 2015 by the UN General Assembly. Our six cases include scientific assessments in a more traditional understanding as well as other forms of science institutions, such as scientific advisory boards and international research networks.

Four characteristics are particularly pertinent for understanding how science institutions can foster perceptions of salience, credibility and legitimacy: their structure; their objectives and function; their internal processes; and their intended outcomes (Sarkki et al., 2015). We have hence selected the six cases that we study for their diversity on these four characteristics. We do not claim to have included all relevant institutions. The selected cases rather represent a diverse sample of science institutions engaged with governance for sustainable development, allowing us to investigate different strategies for pursuing salience, credibility and legitimacy. We briefly introduce our cases in Box 1 A more elaborate overview of our cases based on Sarkki et al., 2015 framework is provided in the Supplementary Material Box 1