How knowledge enables governance: The coproduction of environmental governance capacity

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A B S T R A C T

The creation and mobilization of knowledge are key issues in environmental governance. Consequently, understanding the roles that knowledge may play in governance is crucial for enabling well-informed governance arrangements. An aspect of knowledge-governance interactions that has received relatively little focused attention is that knowledge can be understood to be an intrinsic element of environmental governance. This paper aims to further the theoretical and empirical insight into this aspect. In order to do so, it elaborates a framework that conceptualizes various governance capacities, i.e. regulatory, adaptive, and integrative capacity, in terms of the coproduction of knowledge, values, and social order. This framework is applied in the analysis of three domains of governance that notably concern the management of the Dutch Wadden Sea area. The findings suggest that settling disputes about natural resources, and working towards a sustainable equilibrium between conserving and utilizing nature, may be enabled by means of interactive and flexible governance arrangements that complement centralized governance. Moreover, knowledge may constitute the governance capacities that are needed for reaching such an equilibrium in various ways: as a steering mechanism, as a key to learning, and as a connective element of governance. The findings indicate that enabling well-informed environmental governance is not just a matter of managing the interfaces between knowledge and governance, but also a matter of capacity-building in order to bring about reflexive governance arrangements.

1. Introduction

A key question in many domains of environmental management is how the conservation of the natural environment and the utilization of natural resources can be balanced in a sustainable way. A growing body of literature suggests that governance-oriented forms of environmental management may contribute to realizing such a balance. Environmental governance encompasses forms of collective decision-making and action that are aimed at protecting the environment and resolving conflicts over natural resources; it usually entails the active involvement of both governmental and non-governmental actors (Paavola, 2007; Wallington et al., 2008; Tacconi, 2011; Driessen et al., 2012; Bixler, 2014).

The literature has widely acknowledged that the creation, mobilization, and utilization of knowledge are crucial issues with respect to environmental governance (e.g. Meffe & Viederman, 1995; Giebels et al., 2013; Lemos, 2015). For instance, environmental governance may involve informing decision-making on environmental change,

bringing together a variety of scientific and other knowledges, and dealing with knowledge disputes that may exist between various groups of stakeholders (Burns & Stöhr, 2011; Evans et al., 2011; Armitage et al., 2015; Runhaar et al., 2016). One aspect of knowledge-governance relations that has notably received attention in the literature is that realizing well-informed environmental governance requires managing the boundaries or interfaces that exist between knowledge and governance (Bremer & Glavovic, 2013; Clarke et al., 2013; Wesselink et al., 2013). Such boundary management may involve processes of boundary work, such as coordination work and knowledge exchange between experts and policy-makers (Robinson and Wallington, 2012; Jordan, 2014; Wyborn, 2015a).[1] Moreover, it may involve boundary organizations that "play an intermediary role between knowledge production and decision-making (in different domains and levels), with a view to achieving co-operation in relation to a shared objective (Clarke et al., 2013: 94; see also van Enst et al., 2016). The recent literature usually conceptualizes such boundaries and interfaces as dynamic, interactive, and socially constructed phenomena

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[1] The term boundary work was coined as an analytical concept that denotes the social and political work that is performed to grant epistemic authority to scientific knowledge, with an eye to demarcating it from non-scientific knowledges and activities (Gieryn, 1983). In the environmental governance literature it often has a slightly different connotation as it is used to denote knowledge management across boundaries (Turnhout et al., 2014).

(Bäckstrand, 2004; Bremer & Glavovic, 2013; Wesselink et al., 2013; Janssen et al., 2015). In doing so it implicitly or explicitly dismisses the "linear model" that depicts the relation between knowledge-creation and policy-making as a one-way flow across a static boundary or gap. (Atkinson & Klausen, 2011; Hegger et al., 2012; O'Toole & Coffey, 2013; Wesselink et al., 2013; Wyborn, 2015a).

What has received less attention is that knowledge can also be seen as an intrinsic element of governance. This paper aims to further the theoretical and empirical insight into this aspect. Here, the term "intrinsic" signifies that performing environmental governance always involves knowledge in one way or another. In this paper I will operationalize this idea by means of a conceptual framework that combines the notion of governance as something that is constituted by a set of capacities (e.g., Termeer et al., 2013; Wyborn, 2015b) with the notion of the coproduction of knowledge and social order (Jasanoff, 2004).

The rationale behind this framework is twofold. Firstly, the framework distinguishes three key aspects of collaborative environmental governance. The first aspect is that environmental governance is a form of regulation that aims at reaching particular outcomes regarding the management or conservation of the environment (Lemos & Agrawal, 2006). The second aspect is that environmental governance often needs to deal with complex and dynamic processes in natural systems and with uncertainty on the effects of human interventions. Consequently, it has been argued that environmental governance arrangements need to be adaptive in order to be effective (Folke et al., 2005). The third aspect is that environmental governance usually includes a variety of governmental and non-governmental actors with diverging interests and perspectives. In order to enable collaborative action, such interests and perspectives need to be bridged or integrated (Raymond et al., 2010; Bohensky & Maru, 2011). From these three aspects may be inferred that performing environmental governance requires the capacities to regulate, adapt, and integrate. The next section provides a further operationalization of these three capacities on the basis of the environmental governance literature. Secondly, the rationale of the framework is that these three capacities encompass epistemic, normative, and social components. Accordingly, this paper conceptualizes the creation and application of these capacities as processes in which knowledge, values, and social order are produced together. In doing so, it builds on the work of Jasanoff (2004) and other scholars (e.g. Muñoz-Erickson, 2014; Chilvers & Kearnes, 2015; Wyborn, 2015b), who use the term *coproduction* to refer to this combined and interconnected production of knowledge, values, and social order. This application of the term is distinct from its usage to denote particular forms of collaborative knowledge creation (Hegger et al. 2012). I will use this framework to analyze how governance capacities were built and put into operation in three cases of coastal governance in the Netherlands. This analysis is notably focused towards identifying the roles of knowledge in relation to these capacities. This in turn may provide insight into the ways in which knowledge can be mobilized for building environmental governance capacity.

Section 2 provides an elaboration of the conceptual framework of coproduction and governance capacities. Subsequently, Section 3 describes the materials and methods and briefly introduces the three cases. Section 4 provides the empirical results; it describes how governance capacities were built and put into action in the cases, and focuses on the roles of knowledge in these processes. Finally, Section 5 provides a discussion and conclusion.

2. Conceptual framework

2.1. Coproduction

The term coproduction, as applied in the environmental governance literature, has two distinct meanings. Firstly, it is oftentimes used to denote a type of interactive or participatory process in which various groups of actors, such as experts, policy-makers, and stakeholders, collaboratively create knowledge (Berkes, 2009; Armitage et al., 2011; Edelenbos et al., 2011; Taylor & De Loë, 2012; Clarke et al., 2013). A second denotation of the concept, which is used in this paper, concerns the ways in which knowledge and social order are created together. In this second sense "co-production is shorthand for the proposition that the ways in which we know and represent the world (both nature and society) are inseparable from the ways in which we choose to live in it" (Jasanoff, 2004: 2). From this perspective "knowledge and its material embodiments are at once products of social work and constitutive of social life; society cannot function without knowledge any more than knowledge can exist without appropriate social supports" (Jasanoff, 2004: 2–3). Thus, in this sense knowledge and social order are constructed together in social practices and have a mutually constitutive relation. In recent environmental governance scholarship this second form of coproduction has been applied as an analytical framework, for instance in examining the interplay between knowledge and power dynamics in governance arrangements (Muñoz-Erickson, 2014). Moreover, it has been applied to conceptualize adaptive governance in terms of the "coproductive capacities" that "enable groups of actors to connect knowledge with action" in a governance context (Wyborn, 2015b). The latter application entails conceptualizing governance as a process of coproduction that involves the simultaneous employment of material, cognitive, social, and normative capacities (Wyborn, 2015b). The merit of this way of theorizing is that it conceptualizes knowledge as inherent to governance, thus lending insight into the roles of knowledge as a constitutive element of governance. However, it draws strong analytical divisions between knowledge, values, and social aspects by defining them in terms of distinct capacities (e.g., cognitive capacity, normative capacity, social capacity). The analytical framework that this paper elaborates and applies provides a stronger analytical sensitivity to the intertwinements of knowledge, values, and social order, as it conceptualizes particular governance capacities as being constituted by the interplay of epistemic, normative, and social elements. The next section will provide a further operationalization of this conceptual framework based on the environmental governance literature. Table 1 summarizes the next section by providing a structured overview of the

Table 1
Conceptual framework.

		Elements of governance capacities		
		Epistemic	Normative	Social
Governance capacities	Regulatory	• Knowledge creation and mobilization as enablers or constituents of regulation	• Goals • Visions • Limits	• Rules • Power • Modes of governance
	Adaptive	• Monitoring and understanding environmental change • Learning	• Willingness and opportunity to adapt or revise decisions	• Adaptive decision-making • Flexible arrangements • Iterative processes
	Integrative	• Incorporation of a variety of knowledge forms • Incorporation of diverging knowledge systems	• Incorporation of diverging values and normative frames	• Joint knowledge creation processes • Organized reflection on normative frames and epistemological beliefs