



Understanding socio-cultural dimensions of environmental decision-making: A knowledge governance approach



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ABSTRACT

Sociological critiques of scientific research processes and their application have developed nuanced understandings of the social, cultural and political forces shaping relationships between science and decision-making. Simultaneously, environmental researchers have sought to construct more engaged, dynamic modes of conducting research to facilitate the application of science in decision-making and action. To date, however, there are relatively few theoretically-oriented approaches that have been able to draw productive connections between the sociological critique and the practical applications that can aid in navigating this complex and diverse milieu. In this article, we propose that the concept of “knowledge governance” can bring together targeted inquiry into the socio-political context in which environmental science is situated, alongside analysis of specific interventions that change knowledge-to-action relationships. Drawing together Jasanoff’s (2005) concept of civic epistemology with Cash et al.’s (2003) knowledge systems for sustainability approach, this knowledge governance inquiry framework offers an integrative lens through which to critically reflect on knowledge-based processes, and incorporate that deeper understanding into intervention efforts. We briefly illustrate its application with reference to a pilot project examining conservation decision-making in the Western Pacific island nation of Palau.

1. Introduction

The challenge of connecting scientific knowledge with environmental decision-making has steadily transformed from a niggling preoccupation of frustrated researchers to a multifaceted, rich and complex area of scholarship and practice (Bocking, 2004; Cash et al., 2003; Game et al., 2014; Jasanoff, 2010). Yet for all of the research and scholarship in this area, the sense of frustration with the apparent disconnect between science and decision-making is not diminishing. As Kirchhoff et al. (2013) wrote at the conclusion of their review of efforts to increase the usability of climate information to support decision-making, “In spite of these efforts to rethink and restructure science production, current approaches have not been able to surmount the usability gap.” (406). Similarly, in 2012, the United Nations Environment Program listed “Broken bridges: reconnecting science and policy” as the fourth highest ranked challenge confronting environmental management in the 21st century (UNEP, 2012). These views reflect a normative stance that science should have a stronger say in environmental decision-making, and concerns that societies will face unnecessary hardship by failing to address the challenges posed by environmental change. The role of science in decision-making has been

particularly prominent in the field of sustainability science, where scholars have focused specifically on the agenda of linking knowledge and action (Cash et al., 2003; van Kerkhoff and Lebel 2006; Kirchhoff et al., 2013), and processes for creating usable knowledge (Clark et al., 2016a,b; Buizer et al., 2012; Lemos and Morehouse 2005). An alternative perspective emerges from the critical social sciences, where scholars have pointed to the problematic privileging of science in decision-making settings that are as much concerned with societal norms and values as they are about environmental information and biophysical processes (Castree, 2014; Jasanoff, 2010). The field of science and technology studies (STS) has been particularly active in examining the relationships between science and society from perspectives that include power, politics, institutions, history, and social dynamics (Miller, 2012, 2004; Jasanoff and Long Martello, 2004; Jasanoff, 2011, 2005; Pettenger, 2013). Connections across these two ways of approaching and understanding the challenges of crafting environmental knowledge through research and its role in social and political processes have been made (see, for example, Cote and Nightingale, 2015; Pretty, 2011; Wyborn, 2015), and over the last decade, environmental scientists have become increasingly reflective in their understandings of the social context and political nature of their

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own efforts to effect change (Salas-Zapata et al., 2012). But broadly speaking the sustainability science studies and STS critiques continue to develop in parallel. In comparing sociological and environmental science approaches to understanding interdisciplinary research on social-ecological systems, MacMynowski (2007:n.p.) noted that “there is almost no overlap” between these fields. Yet as environmental scientists build the complexity of their own understandings of the relationships between science and decision-making, there is a growing appetite for more sociologically and politically-informed approaches to environmental science and its influence in practice (Clark et al., 2016a,b; Cornell et al., 2013; Lövbrand et al., 2015).

In this article, we propose that the concept of ‘knowledge governance’ can bridge these two domains of research. Knowledge governance is defined as the formal and informal rules and conventions that shape the ways we conduct or engage in knowledge processes, such as creating new knowledge, sharing or protecting knowledge, accessing it and applying or using it (van Kerkhoff, 2014). We draw specifically on the concept of “civic epistemology” developed by Jasanoff (2005), and “knowledge systems” defined by Cash et al. (2003) as theoretical lenses through which to view the socio-political and cultural dimensions of decision-making, and interventions within it. This is developed as a framework and suite of questions to guide enquiry into the knowledge governance of environmental decision-making. The framework is intended to aid practitioners and researchers to build understanding of the cultural and socio-political conditions that shape the relationships between science and environmental decision-making, while also considering how these conditions emerge as institutionalised rules. We do not presuppose the ends to which practitioners and researchers may direct such deeper understanding—for some, it may be to “improve” relations towards a defined instrumental purpose or normative goal; for others it may be to reveal and reflect on existing power relations. Our own position is that empirical understanding of socio-cultural practices, power and institutions is necessary to achieve interventions that can operate effectively towards a specific goal. The purpose of this paper is to present the intellectual foundations of knowledge governance; to relate it to critical STS studies and sustainability science research; to propose an associated research framework that combines elements of both; and to report on a pilot study that sought to test the framework, examining conservation decision-making in the Pacific island of Palau. We conclude with reflections on the efficacy of the framework, and ideas for future development.

2. Two traditions of understanding science and environmental decision-making

2.1. Sustainability science approaches

Across the broad and diverse literature concerned with efficacy of the linkages between research-based knowledge and action, those that have emerged from frustrations that environmental scientists are not effective in driving social and political change, are largely premised on the normative view that science should have a stronger voice in decision-making. The field of sustainability science in particular has developed a sustained research agenda examining science-society relationships and developing methodologies to achieve these normative goals. In describing the “emerging research program” of sustainability science in 2003, (Clark and Dickson, 2003) write “In seeking to help meet [the] sustainability challenge, the multiple movements to harness science and technology for sustainability focus on the dynamic interactions between nature and society. ... They are problem-driven, with the goal of creating and applying knowledge in support of decision making for sustainable development.” (8059) (see also de Groot 1992 for a discussion of the normative and problem-oriented basis for environmental sciences more generally). As such, sustainability science points towards the active management and interventions that are needed to meet the normative goal of “linking knowledge with action”

to enhance the role of science in decision-making (van Kerkhoff and Lebel, 2006; Miller, 2012).

Sustainability science has supported vigorous debates and growing diversity in the ways in which the relationships between science and society are (or should be) conceptualised and engaged with, largely within research processes (Brandt et al., 2013; Clark, 2007; Miller, 2012; Wiek et al., 2012). This is shown in methodological and practical concerns for ‘what we can do’ as researchers to engage more fully in action and decision-making arenas, viewing the relationships between science and society as dynamic and interactive spaces where researchers are active and deliberate participants in social change. At the project scale, approaches advocating for greater uptake and application of science have grown increasingly sophisticated. There is increasing emphasis on participation and engagement, including recognition of the need to include disempowered and marginalised voices (Fortmann, 2009; Stringer et al., 2006; Reed et al., 2010); reflexivity (Salas-Zapata et al., 2012; Miller, 2012); and co-production of knowledge (Pohl et al., 2010; Armitage et al., 2011; Lemos and Morehouse, 2005). Transdisciplinary methodologies increasingly coalesce around the importance of including local and practice based knowledge in research design and methods (Lang et al., 2012; Polk, 2014; Mauser et al., 2013; Brown et al., 2010). Explicitly concerned with problem solving, solution-finding, social change and transformation, sustainability science is fundamentally interventionist, and researchers’ interests in the interplay between science and society (knowledge and action) reflect those normative goals.

In their seminal work addressing the “knowledge systems” dimensions of sustainability science, Cash et al. (2003) examine the institutional structures that inhibit or facilitate ‘effective’ relationships between science and action. They argue that for research-based knowledge to be effective in supporting changes in practice, it needs to demonstrate characteristics of salience, credibility and legitimacy. As summarised by (Clark et al., 2016a), salience denotes relevance to the decision or policy; credibility denotes technical adequacy in handling of evidence; and legitimacy denotes fair, unbiased, respectful treatment of all stakeholders (2). These characteristics are, in turn, derived from institutional and organisational arrangements that actively manage the boundaries between research and decision making, as well as particular actions on the part of researchers to communicate, translate and mediate across these different communities (Cash et al., 2003). This work emphasises the importance of institutional arrangements such as accountability, as well as ‘boundary organisations’ and ‘boundary objects’ (Clark et al., 2016a; Buizer et al., 2012) that operate at the intersection of science and decision-making. This knowledge systems approach is relevant here because it takes an institutional ‘step back’ from the immediacy of project- or program-based relationships to ask questions of the broader institutional settings that shape the interactions and outcomes. While still concerned with interventions, it highlights the dynamic modes of governance that allow for (or inhibit) the kinds of change or transformation that sustainability research programs aspire to (Cornell et al., 2013).

A brief example illustrating the knowledge systems approach demonstrates this dynamic, institutional orientation. In analysing a major ‘research for rural development’ program of the Consultative Group for International Agricultural Research (CGIAR), (Clark et al., 2016a) applied the three categories of participation, accountability and boundary objects to analyse the relationships between scientists and decision-makers. They highlight the contextual and political nature of these relationships, and identify that the kinds of boundary work needed differed according to the local politics. They note two generalised challenges: the first being the need to integrate contextualised, local knowledge of practice with generalised knowledge from research; and second to understand the “extreme politicization of formal knowledge” (7) (research) in the development context. This demonstrates a significant shift from aiming to develop specific methodologies (of participation, transdisciplinarity etc) to recognising the need to build

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