Global Environmental Change 50 (2018) 75–87

Contents lists available at ScienceDirect

Global Environmental Change

journal homepage: www.elsevier.com/locate/gloenvcha

Learning to live with social-ecological complexity: An interpretive analysis of learning in 11 UNESCO Biosphere Reserves

Lisen Schultz[a,1], Simon West[a,*,1], Alba Juárez Bourke[a,b], Laia d'Armengol[a,c], Pau Torrents[a], Hildur Hardardottir[a], Annie Jansson[d], Alba Mohedano Roldán[e]

[a] Stockholm Resilience Centre, Stockholm University, Kräftriket 2B, 10691 Stockholm, Sweden
[b] Social, Economic and Geographical Sciences Group, The James Hutton Institute, Craigiebuckler, Aberdeen AB15 8QH, UK
[c] Institute of Environmental Science and Technology (ICTA), Universitat Autònoma de Barcelona, Campus UAB, 08193 Bellaterra, Spain
[d] Department of Human Geography, Stockholm University, 10691 Stockholm, Sweden
[e] Department of Political Science, Stockholm University, 10691 Stockholm, Sweden

ARTICLE INFO

Keywords:
Comparative case study
Qualitative
Bridging organizations
Sustainability science
Multi-level governance
Science-policy interface

ABSTRACT

Learning is considered a means to achieve sustainability in practice and has become a prominent goal of sustainability interventions. In this paper we explore how learning for sustainability is shaped by meaning, interpretation and experience, in the context of UNESCO Biosphere Reserves (BRs). The World Network of Biosphere Reserves brings environmental conservation, socio-economic development and research together in 'learning sites for sustainable development.' The World Network is globally significant, with 669 BRs in 120 countries, but as with many paradigmatic sustainability interventions BRs are perceived to suffer from a 'concept-reality gap.' We explore this gap from an interpretive perspective, focusing on participant interpretations of the meaning of BRs and their experiences of working with the concept – with the aim of painting a richer picture of learning for sustainability and the ways in which BRs might fulfil their role as learning sites. We provide a cross-case analysis of learning in 11 BRs around the world, drawing on interviews with 177 participants, and ask: How is the BR concept interpreted and enacted by people involved with BR work? What learning emerges through BR work, as described by those involved? We find that the BR concept is interpreted differently in each location, producing distinct expectations, practices and institutional designs. Learning occurs around common themes – human-environment relationships, actors and governance arrangements, and skills to navigate BR work – but is expressed very differently in each BR. The position of BRs 'in between' social, ecological and economic goals; local places and global networks; and government, private and civil society sectors, provides a valuable space for participants to learn to live with social-ecological complexity. We discuss our results in terms of their contribution to three pressing concerns in sustainability science: (i) power and politics in learning for sustainability, (ii) intermediaries and bridging organizations in multi-level governance, and (iii) reflexivity and knowledge-action relationships. Our comparative hermeneutic approach makes a novel methodological contribution to interpretive studies of sustainability policy and governance.

1. Introduction

Over the past decade understandings of sustainability have been increasingly framed in terms of irreducible complexity, uncertainty and nonlinearity (Biggs et al., 2015a; Leach et al., 2010). Consequently 'learning' has assumed central importance in sustainability interventions, policies and paradigms (Ludwig, 2001; Stirling, 2010). The literature on complex social-ecological systems suggests that knowledge is inevitably provisional and incomplete, and that learning is necessary to facilitate the continual adaptation of management and governance in contexts of dynamic change (Folke et al., 2005; Armitage et al., 2008; Cundill et al., 2015). In the education for sustainable development literature, learning refers to the acquisition of knowledge, skills, attitudes and values that enable action for sustainable development–with a growing focus on the learning process and the capacities needed to navigate complex social-ecological issues (Vare and Scott, 2007; Wals et al., 2014). Several recent studies have aimed to identify variables that foster learning, and explore how learning in turn leads to

* Corresponding author.
E-mail address: simon.west@su.se (S. West).
[1] These authors contributed equally to this work.

https://doi.org/10.1016/j.gloenvcha.2018.03.001
Received 21 July 2017; Received in revised form 22 February 2018; Accepted 1 March 2018

sustainability outcomes (Armitage et al., 2017; Suškevičs et al., 2017). However, there has been much less attention to the ways in which meaning, interpretation and experience inform the content and direction of learning for sustainability (Miller et al., 2014; Stojanovic et al. 2016). Addressing this gap is vital because the ways in which people make sense of the world affect how they learn about and act in it (Wagenaar, 2011). In this paper we contribute to this research gap with an empirical interpretive study of learning in the UNESCO World Network of Biosphere Reserves (WNBR).

The evolution of the Biosphere Reserve (BR) concept reflects the increasing attention to complexity and learning in sustainability science, policy and practice. Conceived in 1973 under the auspices of the UNESCO Man and Biosphere Programme (UNESCO MAB), the WNBR initially sought to preserve a collection of "representative significant ecosystems" and to encourage basic environmental research and monitoring in these sites (Ishwaran et al., 2008, p.121). In the 1980s and 1990s the BR concept was reinterpreted in light of the growing focus on sustainable development to emphasise three functions: biodiversity conservation, socio-economic development, and logistic support for education, research and monitoring (Batisse, 1986; UNESCO, 1995). The earlier definition of BRs as protected areas gave way to an understanding that BRs would contain three types of zoning – core areas of high ecological value with legal protection, buffer zones of limited human use, and transition areas with larger human populations pursuing sustainable development (UNESCO, 1995). The 2000s and 2010s have seen further evolution of the BR concept, with a growing emphasis on adaptive management, interdisciplinary research and co-production of knowledge between inhabitants, participants and researchers, expressed through the framing of BRs as 'learning sites for sustainable development' (UNESCO, 2008). UNESCO's declaration of BRs as "science for sustainability support sites" (UNESCO, 2016a) highlights the close links between the contemporary BR concept and academic conceptions of complex social-ecological systems (Schultz and Lundholm, 2010; Schliep and Stoll-Kleeman, 2010), as well as the broader grouping of sustainability science (Kates et al., 2001). BRs therefore represent learning sites in both practical and reflexive senses – as a means of fostering the active pursuit of sustainable development, while also enhancing academic understanding of what learning for sustainability might entail and how it might be studied.

Nevertheless, the evolution of the BR concept has taken place in the midst of frustration at an apparent "concept-reality gap" (Coetzer et al., 2014, p.83; Matysek et al., 2006; Price, 2002). This perceived gap has taken two forms. On the one hand it became clear that many 'first generation' BRs designated in the 1970s as ecological baseline areas did not correspond with the evolving meaning of BRs as multi-use zones (Price, 2002; note that this does not necessarily mean that these first generation BRs were performing badly as ecological baselines). The periodic review process inaugurated in the 1995 Seville Strategy consequently aimed to retain the basic integrity of the concept by ensuring "within a reasonable period, that all members of the WNBR do fulfil the three complementary and mutually reinforcing functions of biosphere reserves, so that the reality comes to match the concept" (Price, 2002, p.15). On the other hand, a number of studies have indicated that BRs that *are* attempting to follow the contemporary vision are not meeting expectations for various reasons, including development pressures (Coetzer et al., 2014), antagonism from local government (Mercer and Hyman, 2009), lack of buy-in from local citizens (Yuan et al., 2008), and lack of funding, capacity or governance support (Schliep and Stoll-Kleeman, 2010; Reed, 2016b). These issues highlight the difficulties faced by practitioners in working with the BR concept, in the context of evolving meanings at a global policy level and the messy realities of pursuing sustainability in their own particular contexts. They are also symbolic of the broader struggle to ensure that global sustainability policy programmes achieve practical on-ground effects.

So far, the WNBR has addressed the diverse meanings, expectations and experiences surrounding the BR concept by attempting to ensure conformity with a "clear and shared vision of the BR concept," with a view to encouraging scientific research that identifies 'success factors' and 'barriers' in reaching this vision (UNESCO, 2015, p.14; Cuong et al., 2017). This approach implicitly privileges an empiricist or positivist mode of research (Newing, 2011). In an empiricist approach, experts pre-define the meaning of the BR concept before structuring social action in each BR in terms of 'variables' such as, for instance, stakeholder status, trust, and learning (Schaffer, 2015). Researchers then explore the "bivariate relationships of these variables to outcome criteria," with the aim of enabling practitioners to better manipulate variables in pursuit of desired outcomes (Wagenaar, 2011, p.28). In this vein, two global surveys have explored the relationships between participation, learning and successful ecological and socio-economic outcomes in BRs (Stoll-Kleemann and Welp, 2008; Schultz et al., 2011). Empiricist research is valuable and useful for illuminating general trends (Newing, 2011). However, it is less able to explore how social activity is shaped by the intentions of actors and the significance it has for those involved (Fay, 1996). Terms like 'participation,' 'trust' and even 'biosphere reserve' may have quite different meanings for practitioners in different contexts. Furthermore, the generalist nature of empiricist approaches means they rarely produce results that are directly relevant for any particular BR (e.g. Yanow, 2000), and much of what is most meaningful for those working with the BR concept is omitted from the analysis (e.g. Rolfe, 1998). Consequently, empiricist research – on its own – may actually reproduce rather than close the perceived gap between theory and practice.

In this paper, by contrast, we accept that BR practitioners will interpret the BR in legitimately different ways, and indeed that they *must* do so in order to make the concept locally useful and relevant. We therefore explore learning from the perspective of those involved in enacting BRs 'on the ground,' to see how the concept is interpreted and enacted in particular contexts, and what types of learning the participants themselves perceive to be occurring (we use the term 'enactments' to refer to actions justified as BR work by the people undertaking them, i.e. actions that 'bring the concept to life'). This represents an 'interpretive' approach–which focuses on the "meanings that shape actions and institutions" (Bevir and Rhodes, 2002: 130). Rather than structuring action in terms of variables prior to engagement with participants, interpretive approaches seek to understand the conceptual schemes that the participants themselves use to structure their experience (David, 2010). Interpretive research therefore pursues intentional rather than causal explanation, and seeks to illuminate plausible relationships between meanings and outcomes (Fay, 1996). The aim is not to provide BR practitioners with variables to manipulate, but to foster more productive reflection on practice, and enhance the conversation around what is possible and desirable in 'BR work' (e.g. Yanow, 2000, p.19). At stake, then, are two distinct epistemologies, and two distinct ways of thinking about how science may 'intervene' in the world to encourage learning for sustainability. Note that in adopting an interpretive approach we do not advocate for the abandonment of standards around the BR concept (e.g. the Statutory Framework of the WNBR); indeed, these are vital for inspiration, coherence and coordination in a global policy programme. Rather, we suggest that standards should develop in rigorous dialogue with the meanings and experiences of all those working with the BR concept.

The distinctiveness of empiricist and interpretive approaches means they are often considered to be conflicting – but the research we present here shows how they can in fact be complementary. In the GLEAN project (A Global Survey of Learning, Participation and Ecosystem Management in Biosphere Reserves), a longitudinal global survey of 146 BRs produced general inferences about how participation, monitoring and knowledge generation relate to perceptions of BR success (Schultz et al., 2011). This empiricist approach also indicated the importance of the qualitative dimensions of participation for learning, such as stakeholder interpretations of the purpose, character and legitimacy of participation in each BR (Schultz et al., 2011). For the next