



In search of systemic innovation for sustainable development: A design praxis emerging from a decade of social learning inquiry



John Colvin^{a,b,*}, Chris Blackmore^a, Sam Chimbuya^b, Kevin Collins^a, Mark Dent^c,
John Goss^d, Ray Ison^{a,e,**}, Pier Paolo Roggero^f, Giovanna Seddaiu^f

^a Applied Systems Thinking in Practice Group, Engineering & Innovation Department, The Open University, UK

^b Letsema Circle Trust, East London, South Africa

^c School of Environmental Sciences, University of KwaZulu-Natal, South Africa

^d Cinnabar, Johannesburg, South Africa

^e Monash Sustainability Institute, Monash University, Clayton, Australia

^f Nucleo di Ricerca sulla Desertificazione and Dipartimento di Agraria, Università degli studi di Sassari, Sassari, Italy

ARTICLE INFO

Article history:

Received 30 October 2013

Received in revised form

20 December 2013

Accepted 27 December 2013

Available online 30 January 2014

Keywords:

Design

Framing

Governance

Social learning

Sustainable development

Systemic innovation

ABSTRACT

Processes of designing for systemic innovation for sustainable development (SD) through the lens of three long-term case studies are reported. All case studies, which originated from the SLIM (Social Learning for the Integrated Management and Sustainable Use of Water at Catchment Scale) Project, funded within the EU Fifth Framework Program (2001–2004), constitute inquiry pathways that are explored using a critical incident approach. The initial starting conditions for each inquiry pathway are compared; significant pathway dependencies are identified which foster the development of social learning processes locally, but constrain their uptake and embedding across the wider system of interest. In the first case study, in England & Wales, promising developments in the application of social learning approaches to river basin planning over an initial 3-year period were subsequently marginalised, only to resurface towards the end of the 10-year period of study. In the second, South African case study, significant spaces for social learning and innovation in integrated water resources management were opened up over a five year period but closed down again, primarily as the result of lack of policy support by national government. The third, Italian, case study was designed to assess options for adapting to climate change by opening up new learning spaces between researchers, stakeholders and policy makers. A case for investing in local level systemic innovation through social-learning praxis design approaches and in learning processes around well contextualised case-studies is supported. However, concomitant investment by policy makers in social learning as an alternative, but complementary, governance mechanism for systemic innovation for SD is needed.

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1. Introduction

Considerable attention has been devoted over the past decade to understanding processes of innovation for sustainable development (SD). Significant research agendas have developed around understanding transitions in socio-technical systems

* Corresponding author at: Applied Systems Thinking in Practice Group, Engineering & Innovation Department, The Open University, UK. Tel.: +44 1453 836722.

** Corresponding author at: Monash Sustainability Institute, Monash University, Clayton, Australia. Tel.: +61 404308180/3 93293147.

E-mail addresses: j.d.colvin@open.ac.uk (J. Colvin), c.p.blackmore@open.ac.uk (C. Blackmore), sam@letsemacircle.co.za (S. Chimbuya), k.b.collins@open.ac.uk (K. Collins), dent@ukzn.ac.za (M. Dent), jgoss@iafrica.com (J. Goss), ray.ison@open.ac.uk, ray.ison@monash.edu (R. Ison), pproggero@uniss.it (P.P. Roggero), gseddaiu@uniss.it (G. Seddaiu).

as well as transformational processes in social–ecological systems. While transitions, adaptive management and resilience perspectives offer many insights into how socio-technical and social–ecological changes occur and/or become established, we argue that their lack of focus on a design process – despite a growing interest in ‘tools’ and ‘strategies’ for sustainability transitions (Farla et al., 2012) – leaves a gap when considering innovation for sustainable development. This paper addresses that gap as we adopt a systemic perspective on innovation for SD which focuses directly on the issue of design praxis.

‘Design’ can be characterised as an involvement in any activity that has many players and that translates human culture, technology and aspiration into form (Coyne and Snodgrass, 1991) and, in the terms employed here, focuses on purposeful practices initiated and sustained by design practitioners seeking to orchestrate systemic innovations in governance. We

have a particular interest in ways of designing that are sensitive to context, equitable and sustainable. Our approach echoes Ingram's (2008) injunction for the water sector that: "Attempts to design improved water resources management and institutions must attend to context. Standardised reforms have failed time after time ..." (p. 17).

In this paper we first situate our concerns within a brief overview of literatures associated with transitions in socio-technical systems and transformational processes in social-ecological systems so as to differentiate our research (Part 2). Our research which is both reflexive (Alvesson and Sköldböck, 2000) and deliberative in enactment (Hajer and Wagenaar, 2003) investigates approaches to designing unfolding processes of systemic innovation. 'Innovation' is used here to refer to new processes, institutions or ways of working that aim to meet a set of needs or tackle a set of problems (World Bank, 2006; Bacon et al., 2008) – in this case the challenges of SD. Innovation is about more than ideas (inventions) as it concerns implementation, and for some, a step-change from earlier practices (Hartley, 2005) – hence the link with design praxis. Systemic innovation is understood as an emergent property of the changes in practices and understandings that are enacted in contexts of concern (Collins and Ison, 2010).

As elaborated in our methodological approach (Part 3), the key research question we address in this paper is how social learning design praxes, interpreted as theory-informed practical actions, have helped to support and stimulate systemic innovation, looking both at the key 'operational' ingredients of these learning processes and at how our praxes were conceptualised. This is done (Part 4) through three long-term case studies which had their origins in the research associated with the SLIM Project (Ison et al., 2004), an EU Fifth Framework Project (2001–2004; Ison et al., 2007). Importantly we understand social learning as both process (between multiple stakeholders generating contextually grounded systemic innovation) and entity i.e. a governance mechanism which can be used in policy or is the focus of investments (Ison et al., 2013); we elaborate on our explanation of social learning in Section 4.1. In Part 5, reflections on systemic innovation and the contribution of a social learning-based design approach are offered.

2. Situating the research

Research on transitions in socio-technical systems has drawn on insights from innovation studies, evolutionary economics and the social shaping of technology (Rip and Kemp, 1998; Geels, 2005). It involves small networks of actors coming together in a 'transition arena' to 'seek consensus with each other about the need and opportunity for systemic change, and coordinating amongst themselves to promote and develop an alternative' (van der Brugge and van Raak, 2007, p. 33). But while this small group of innovation-oriented stakeholders may succeed in a process of local ('niche') innovation, transitions are only said to occur when niche innovations break through and become established within wider 'socio-technical regimes', eventually influencing the broader 'socio-technical landscape' (Geels, 2002). The aim of transition research is to understand how sustainable regimes might become established over time (Geels and Schot, 2007).

In contrast to the socio-technical systems agenda, research on social-ecological systems is typically rooted in a particular spatial context, such as a watershed or a forest. Furthermore, the original objective of social-ecological systems research was to support resilience in existing desired systems and, less frequently, to transform such systems into states understood as more desirable from a sustainability perspective (Walker et al., 2006). The balance of this research agenda has shifted. It is now argued that the resilience of complex adaptive systems is not simply about resistance to change,

the capacity to absorb disturbances and the conservation of existing structures, but also about the opportunities that disturbance opens up in terms of recombination of evolved structures and processes, renewal of the system and emergence of new trajectories (Folke, 2006). In this sense, resilience provides adaptive capacity (Smit and Wandel, 2006) that allows for continuous development, like a dynamic adaptive interplay between sustaining and developing with change.

In terms of applying these concepts in practice, many researching social-ecological systems from a resilience perspective align with the literatures on adaptive management (e.g. Holling, 1978; Jiggins and Röling, 2000; Allen and Stankey, 2009); adaptive co-management (e.g. Fabricius et al., 2007); adaptive governance (e.g. Folke et al., 2005; Olsson et al., 2006) and strategic adaptive management (e.g., Kingsford et al., 2011). This literature is extensive; approaches comprise a range of practices that are sometimes systemic (relational, holistic) and sometimes systematic (linear, step-by-step) with varying overlaps. For example, some authors position adaptive co-management as a set of practices that sit within a wider set of 'adaptive governance' arrangements, referring to a set of polycentric institutional arrangements that are nested, quasi-autonomous decision-making units, operating at multiple scales (Ostrom, 1996; McGinnis, 1999).

Fewer researchers, however, discuss how to design adaptive management systems as a means of building resilience (and transformation) for social-ecological systems. Much of the research in this area focuses on *ex post* analysis of leadership for adaptive management (e.g. Olsson et al., 2004, 2007; Biggs et al., 2008; Plummer, 2009) rather than *ex ante* and formative evaluation studies of doing it in practice (but see Allen and Stankey, 2009). Drawing on these analyses, Olsson et al. (2006) argue that it should be possible to steer social-ecological systems through a transformation towards adaptive governance by following a three-phase trajectory of (i) preparing for change; (ii) navigating the transition; and (iii) building resilience of the new desired state. This three phase schema is borrowed directly from mainstream organisational development models based around a three-stage process of 'unfreezing'; 'managing the change'; and 'freezing the new state', originally developed by Lewin (1947). This model is not without its critics (Leach et al., 2007; Weick and Quinn, 1999) as adaptive governance approaches assume that consensus building on problem definition and goals is possible, and that these goals will become evident to all through better scientific knowledge of the problem. Disagreements and polarised interests are therefore problematic for adaptive governance strategies, as such cleavages hinder the kind of consensual knowledge production, voluntary strategic action, and shared mission that scientists advocating adaptive governance see as essential for effective social-ecological management.

Our research intersects theoretically, methodologically and normatively with the concerns of 'transition' and 'resilience' scholars but is built on distinct theoretical and methodological lineages that are often not present or apparent in the former. A key point of departure is our focus on praxis that is underpinned by systems, action, design, performative and inquiry research approaches (Churchman, 1971; Checkland, 1981; Coyne and Snodgrass, 1991; Torbert and Associates, 2004; Hajer, 2005; Reason and Bradbury, 2008). Other important lineages include agricultural extension and rural development research (Röling, 1988; Ison and Russell, 2000), systems thinking in practice (Checkland, 1981; Bawden, 2010; Ison, 2010a), applied learning theories (Hubert et al., 2000; Blackmore et al., 2012) and third-order knowledge management (Cook and Brown, 1999). Central organising concepts have been that of 'transformation' and the 'adaptive whole', key constructs within systems theory (Checkland, 1981).

Fig. 1 is a heuristic built upon our theoretical traditions and, initially, 14 empirical case studies carried out from 2000 to 2004

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