



Jumping off the treadmill: transforming NRM to systemic governing with systemic co-inquiry

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Jumping off the treadmill: transforming NRM to systemic governing with systemic co-inquiry

While there is continued interest in Deliberative Policy Analysis (DPA) its practice element appears to have been underappreciated. We reflect on our experience of using a systemic co-inquiry to provide new insights into operationalising DPA that may assist it to speak more immediately to issues related to governing in the Anthropocene. Natural resource management (NRM) in Australia embraced the global turn to governance, but demonstrated how difficult it is to achieve systemic, collaborative approaches to management policy. The treadmill of our title symbolises the experience of community and organizational stakeholders in the case area, who were constantly in motion but achieving no forward movement in collaborative governance. A systemic co-inquiry into how decision making and action taking in NRM could be improved began in 2015. Systemic co-inquiry is a facilitated process that enables emergence of ideas and opportunities for transforming a situation. We describe this process, present how it was used in the case area, then critically reflect on its contributions for governance and practice, and its theoretical and political implications. Describing and critiquing our use of systemic co-inquiry provides new insights to address challenges for future DPA.

Keywords: systemic co-inquiry; natural resource management; systemic governance, deliberative policy analysis

Introduction

This paper focuses on innovation in governance by considering how systemic, relational policy and practice development could be operationalised as part of a shift towards systemic/adaptive co-governance. The domain for this consideration is Australian natural resource management (NRM), where it is understood as “the integrated management of the natural resources that make up Australia’s natural landscapes, such as land, water, soil, plants and animals”.¹ While use of the term is not limited to Australia, this framing has become widely institutionalised there. An appreciation of the constraints and possibilities of an NRM framing is needed when seeking to innovate and

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3 foster meaningful change. The paper leads, then, with an exploration of the initial
4 starting conditions created by NRM. We then report on an ongoing attempt at
5 transformative reframing in this domain using systemic co-inquiry. Systemic co-inquiry
6 is a form of collaborative investigation; it involves processes of social learning within
7 which opportunities emerge and are pursued into action (Foster et al. 2019). Systemic
8 co-inquiry can therefore be a way of governing, in which on-going inquiry and action
9 between people in situations of concern is built into the institutional ecology of on-
10 going human-biosphere relations (Ison and Straw 2020).ⁱⁱ Presenting and reflecting on
11 our experience of this on-going inquiry within NRM, we describe our understanding
12 and use of systemic co-inquiry. We conclude with critical reflections on our experience
13 of using systemic co-inquiry and their relevance to, and implications for, Deliberative
14 Policy Analysis (DPA).
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32 **Starting conditions: The pendulum swing of NRM governance in Australia**

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34 NRM is enacted in situations of complexity and uncertainty, where multiple human
35 interests converge in dynamic biophysical landscapes. While NRM seeks to manage
36 human activity and support ecological processes, the predominant disciplinary base of
37 NRM has been the biophysical sciences. In the NRM tradition, science sits inside an
38 administrative regime of scientific management, in which scientific knowledge and
39 expert opinion guide policy decisions, which in turn guide efficient and effective action
40 on environmental degradation, administered through an impartial public service
41 (Brunner and Steelman 2005), and more recently, neo-liberal smaller government.
42 Historically this regime has involved little social science, even less social systems
43 science, given scant legitimacy and capacity for reflection and deliberation, and has
44 limited focus on governance to the administrative sense. Given anthropogenic pressure
45 on natural resources such as land, soil, freshwater and biota (Rockström et al. 2009),
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3 approaches to future NRM policy making and implementation are part of the response
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5 shaping how humans will be sustained (or not) in the future. As the M in NRM implies,
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7 management has been the focus of concern; our work contributes to the shift of concern
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9 from managing to governing.
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12 There have been many proposals for collaborative management processes and
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14 research into how collaborative managing and adaptation works, and the conditions
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16 under which it works. In fact, as we outline below, Australia was a pioneer in
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18 community-based, participatory managing (but not necessarily governing). Despite a
19
20 great deal of activity, and initial optimism of community members, NRM is still
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22 predominantly a top-down activity. Little is known about how to shift existing
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24 governance regimes towards improvements in arrangements and practices that are
25
26 determined collaboratively. The problem can be framed as: top-down attempts to
27
28 improve governance fail to connect to the on-going self-organising of
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30 participants/stakeholders in the governance system. We thus need ways to rapidly
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32 transform governance and to insitutionalise relevant understandings and practices
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34 (Foster et al. 2019).
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40 The Australian continent had been occupied and managed by people for at least
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42 60,000 years before it was claimed by Britain in 1788. The colonisers brought with
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44 them the policy, history, and practices of England specifically, and Europe more
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46 generally. During the 1800s, colonial governments sought to increase the population by
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48 developing agriculture and exporting commodities such as wool. Government agencies
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50 soon arose within the colonies to support the management of, and production from,
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52 land, forests and water. Upon Federation in 1901, the Australian States assumed
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54 primary responsibility for NRM (Bates 2006). Agriculture and related agencies in each
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56 Australian State developed issue-based programs targeting threats to productivity such
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3 as soil erosion, weeds and salinity, and these programs continued to be developed by
4 technical experts and delivered by technical extension agents through to the mid 1980s
5 when fundamental reforms began (Head 2009). Through the 1970s, a vanguard of
6 Australian soil conservationists, extension agents, and farmers were influenced by new
7 rural development theory that emphasised self-help and cooperative community effort
8 supported by change agents (Curtis 1998). In the 1980s, the agencies for agriculture,
9 soil conservation, wildlife and rivers began to be integrated within each State, in an
10 attempt to manage landscape processes holistically. New alliances formed across
11 government and non-government sectors. In 1985, a new approach, based on local
12 farming community groups, called 'Landcare', rapidly into a nation-wide 'Decade of
13 Landcare' program funded by Federal and State governments (Curtis and Lockwood
14 2000). Landcare focused on local participatory action and capacity building for
15 sustainable management of natural resources, mostly on privately owned land (Youl et
16 al. 2001). While technical experts provided support, farmers were the key actors,
17 working in local groups to assess degradation on their properties, improve practices and
18 remediate damage (Lockie 1998).

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40 In the 1990s, a perceived failure of locally-organised projects to create the extent
41 of landscapes change desired by governments converged with mobilisation of the
42 interests of Indigenous people, declining economic viability for rural producers,
43 rationalisation of infrastructure spending and withdrawal of government services,
44 increasing diversity in rural economies and communities, and a trend to collaborative
45 planning, to raise interest in regional scale catchment planning (Morrison and Lane
46 2006). This belief in the possibilities of regional governance accorded with enthusiasm
47 for regional level decision-making in environmental management worldwide (Jennings
48 and Moore 2000).

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3 Stakeholder participation was (and remains) an objective for NRM in numerous
4 pieces of State legislation and Federal policy (Marshall 2008), but there was always a
5 gap between the rhetoric and practice of participatory governance in the regional
6 delivery model (Lockwood and Davidson 2010; Prager 2010). More than 50 NRM
7 regional bodies were created as a level of organization between Government (State and
8 Federal) and community based groups, initially under the shelter of a Natural Resource
9 Management Ministerial Council (Robins and Dovers 2007). For example, in the State
10 of Victoria, regional Catchment Management Authorities (CMAs), were formed as
11 statutory authorities responsible to a Minister, with Ministerial-appointed boards. The
12 regional bodies were created to link local communities, State-based planning and
13 Federal policies and investment (Head 2009). They became the main route for funding
14 on-ground work (Lockwood et al. 2009). Local community organizations such as
15 Landcare groups had informal links with regional bodies, however, with regionalisation
16 came more rules and accountability. Neo-liberal economics and new public
17 management created a system of administration organised around the needs of
18 governments acting as purchasers of outputs, which regional NRM bodies delivered
19 (Marshall 2009). From 2000, Federal programs required that regional priorities guide
20 funding allocations, strengthening the role of regional bodies at the expense of local
21 decision making (Curtis et al. 2014). By the mid-2000s regionally devolved governance
22 had peaked, and centralised decision began to return (Robins and Kanowski 2011).
23 Local Landcare groups and networks in Australia now have their reach and
24 effectiveness constrained by the dominance of State and Federal targets and by gradual
25 reduction in funding (Tennent and Lockie 2013; Colliver 2012).
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3 With the clarity of hindsight, NRM in Australia has felt a pendulum swing from
4 top-down government control, to the privileging of local community participation and
5 empowerment, and back to top-down control (Stephens 2013). In the 1980s, policy
6 makers delegated power for communities to decide, through participation and
7 deliberation, what action would be supported locally, enabling local solutions that fitted
8 the complexity and uncertainty of landscape-scale change. In the 1990s the growing
9 focus on regionalism devolved central power to the regional bodies, but this undermined
10 existing relationships between local and regional level (Lockwood et al. 2009). The
11 operating assumptions at this time appear to be that causes can be known, there are
12 linear relationships between actions and outcomes, and that technically-generated data
13 are facts. There appears to have been no sense that development of values, knowledge
14 and discourse involves a dynamic relationship between a biophysical system and human
15 culture, (Norton 2005), and no appreciation of the relational capital that underpins
16 effective NRM (Wallis and Ison 2011). The regional approach continues to structure
17 NRM, but the regional bodies and community organizations have not created forums for
18 critique and redesign of institutional arrangements and practice based on an
19 epistemology that understands and values knowledge creation and problem solving in
20 diverse stakeholder settings as shared experiences (Mackay, 2018). Instead, regional
21 and local practitioners have accepted and adapted to each new set of funders' priorities
22 and protocols, and funders and policy makers have not supported inquiry into
23 governance.

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26 The treadmill of our title is this: each swing of the policy pendulum is imposed
27 from above, with a new framework for practice, new measures of legitimacy and new
28 understandings of what knowledge is legitimate (Figure1). The imposition occurs
29 without reflection on current institutional arrangements and practices, and without
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3 sensing and building on what is already working. Each swing brings a new set of
4 arrangements, and a scramble to reconfigure practices while addressing on-going
5 changes in ecologies, economies and communities. Governance arrangements change,
6 but each change undermines what has been built in the last swing, such that people must
7 run just to stand still. Different ways of designing and enacting governance of natural
8 resources are urgently needed (Ison 2018; Ison, Allan, and Collins 2015; Mackay 2018).
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23 Figure 1. The pendulum swing of governance and the constant treadmill of activity that
24 achieves little
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26 27 **Systemic co-inquiry of NRM governance in Victoria**

28 29 *Overview*

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33 In the State of Victoria, the pendulum swings have produced a cohort of community and
34 government stakeholders who have tasted and tested local, regional and centralised
35 approaches to NRM decision making and action. They are attuned to the rhetoric that
36 attends each promise of a new approach, but remain committed to collaboration and
37 deliberation at the interface of the social and the biophysical. The systemic co-inquiry
38 presented in this paper began as an invitation to some of these capable and attuned
39 NRM stakeholders to improve governance. Could they step off the treadmill and
40 develop a contextually situated, collaboratively constructed practice of innovation in
41 governance (Ison 2018; Steyaert and Jiggins 2007; Mackay 2018)? This is not as bold
42 as it might seem- action research in the Port Philip and Westernport and Corangamite
43 regions of Victoria in 2014-15 had demonstrated the potential of systemic co-inquiry to
44 re-think roles and practices between local and regional levels of governance (see
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3 Mackay et al. 2014; Mackay 2018).

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5 A network of researchers coalesced into a consortium, the authors of this paper,
6 to create a co-inquiry process between local, regional and State level practitioners. The
7 researchers are part of a wave of empirically-grounded post-positivist practitioners, in
8 the tradition of those described by Hajer and Wagenaar (2003), strongly anchored in
9 action research/inquiry traditions, and largely interpretivist and constructivist in
10 orientation (e.g. Ison, Røling, and Watson 2007; Colliver 2012; Allan and Curtis 2005;
11 Mackay 2018; Wallis and Ison 2011). Researchers from other traditions joined and
12 remained as the inquiry progressed (e.g. Mumaw and Bekessy 2017). The consortium
13 members bring their understandings and practices to the inquiry; we each have unique,
14 embodied histories out of which we think and act (Russell and Ison 2007). Our focus on
15 collaboration and co-design mean we strive to bring these histories into awareness, and
16 this demands reflexivity (Ison 2018). Together, we accept complexity, and assume
17 change and unknowability rather than stable states (e.g. Schön 1973). We encourage
18 thinking systemically and collaboratively, favouring deliberating and co-designing over
19 solving, and testing in action over extended planning. We also embrace talking and
20 listening over time (see Innes and Booher 2016, on collaborative rationality) and seek to
21 expose and value multiple partial perspectives (Churchman 1971). We focus on starting
22 conditions and institutional support, and build collaboration around these (Ansell and
23 Gash 2007). We understand innovation in governance as an emergent property of
24 changes in understandings and practices enacted in contexts of concern (Collins and
25 Ison 2010) and interest (Mackay 2018), with systems and second-order cybernetic
26 scholarship (Ison 2002; Ison et al. 2004; Ison 2017) fundamental to the design and
27 conduct of our work.
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Undertaking the systemic co-inquiry

Systemic co-inquiry builds on co-operative inquiry (Heron and Reason 2001); participants as co-researchers contribute to the design, implementation, monitoring and evaluation of research. It is a specific type of collaborative inquiry which draws on systems theories, methodologies and techniques (Dewey 1933; Churchman 1971; Checkland 2002; Blackmore 2009; Ison 2017; Mackay 2018). Systemic co-inquiry is underpinned by acknowledging that much is not known, and focuses on processes of social learning and the emergence of opportunities, rather than on pre-defined timelines, blueprints and outputs common to projects and programs (Ison 2002). The process of systemic co-inquiry is purposefully designed and facilitated, bringing people together around a situation of concern to understand possibilities and constraints, and to design and test alternative institutional arrangements and practices. It creates a safe space for inquiry, embedded in networks and hierarchies, where investigation and reflection are valued. Systems thinking brings attention to the context of concerns, to multiple rather than single causes, and to patterns that repeat. A facilitated process, framed as an inquiry, enables people to encounter their differing points of view, to maintain momentum when there is difference and uncertainty, and to design ways for improving governance. Figure 2 illustrates systemic co-inquiry as a process purposefully designed for the circumstances-to-hand. In the following section we show how this general approach was used to explore NYM governance.

Figure 2. The design for the systemic co-inquiry, adapted from Mackay (2018)

Implementation of systemic co-inquiry of NRM governance

The implementation of our systemic co-inquiry is unusual, in being convened by and for practitioners in NRM governance. It was initiated not as part of a government program, but by a Landcare facilitator undertaking PhD research (Mackay 2018; Mackay et al. 2014). In investigating participatory process in NRM, Landcare networks in the Corangamite region said they wanted to understand why their community-based approach to improving land management and restoring landscapes was so little understood by staff in regional and State level programs. Six workshops with the Corangamite network used systemic co-inquiry to build relationships and understandings between local and regional levels, but participants concluded that most of the opportunities they developed needed State level support to prosper.

Building on that PhD research the systemic co-inquiry moved to the State capital, Melbourne, targeting NRM practitioners who sensed systemic failure and wanted to step off the treadmill and re-think governance. State and Federal-level practitioners were invited to join local and regional practitioners (some from the Landcare network-based inquiry) in a new round of inquiry titled the Systemic Inquiry into NRM Governance in Victoria. Over 14 months, five workshops drew together practitioners from Landcare groups and other community environmental volunteer networks, CMAs, State government agencies, local government, philanthropic trusts and universities. Numbers grew from an initial 23 to 45.

Through the inquiry participants settled on four opportunities for improving NRM governance (Figure 3). *Operationalising the Victorian Biodiversity Strategy* looked to strengthen local level agency in relation to State goals for biodiversity. *Integrating NRM planning across local, regional and State scales* considered how each level of governance could understand and work with the imperatives driving other

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3 levels. *Creating a common language for measuring NRM* tackled the failure to measure
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5 outcomes in a way that spoke simultaneously to Treasury, program designers and the
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7 practitioners delivering programs. *Co-designing the partnership between community*
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9 *and government* investigated how to turn the rhetoric of partnership into decision
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11 making that actually considered community priorities. To these, the consortium itself
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13 added a fifth opportunity: development of a platform to sustain innovation in NRM
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15 governance.
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25 Figure 3. Five opportunities in the Systemic Inquiry into NRM Governance

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27 Throughout the five workshops, the research consortium documented workshop
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29 outcomes, so that participants could hold their thinking as it developed, and introduce
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31 ideas to colleagues and managers. From Workshop 2, some working groups began to
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33 pursue their opportunity outside the formal workshops, with the consortium assisting
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35 with introductions, facilitation and guidance on how to keep thinking systemically. A
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37 ‘meta-inquiry’ by the consortium explored how systems thinking and action was
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39 maintained in each of the working groups.
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45 ***Analytical/deliberation tools***

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47 The activities of any particular systemic co-inquiry will vary to fit the context; here we
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49 describe the methods used in three stages of this inquiry: *framing the inquiry*; *focusing*
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51 *in* to select opportunities for improving governance; and, *moving from what is to what a*
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53 *system could be*. Our systems thinking tools and activities drew from documented
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55 methods (Armson 2011; Blackmore et al. 2017) and from our collective facilitation
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57 practice. The tools are similar to those used in systemic co-inquiry into implementation
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3 of the Water Framework Directive in England Foster et al. (2019). The activities and the
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5 workshop sequence were built as we progressed, with the consortium meeting to review
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7 the previous workshop and plan the next, supported by feedback from participants.
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10 *Framing the inquiry* began with an invitation, distributed through the
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12 professional networks of the consortium, and then of those who joined the Inquiry, to
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14 people in NRM known to be dissatisfied with business-as-usual, and had a track record
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16 of innovating in governance in their institutional locale. The invitation spoke directly to
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18 practitioners' dissatisfaction and their desire to 'do NRM better', but did not attempt to
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20 define what 'better' meant. Nor did the invitation promise solutions, only inquiry. It
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22 named the pressure to deliver results within projects and programs as part of the
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24 problem of improving NRM governance, in that this squeezed out opportunities for
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26 critical reflection and discussion of practice. We left it to participants to negotiate space
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28 in their schedules to attend the workshops, but noted we expected a commitment to the
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30 full process once people had decided they wanted to be involved.
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35 The majority of those who responded came as practitioners, from local and
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37 regional levels of governance, with no mandate to improve governance other than their
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39 own interest. The workshops did not begin with a set of concerns but with a collective
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41 inquiry into people's experience of NRM governance and a search for opportunities to
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43 do NRM better. Those opportunities provided a starting point for investigating how
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45 governance was currently organised around each opportunity, drawing on the differing
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47 perspectives of participants interested in that situation, then on their reading of the
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49 experience and interests of those not in the workshops who also had a stake in the
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51 situation. Many participants were unknown to each other until the day they assembled,
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53 so inquiry processes were designed to allow people to get to know each other as
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55 practitioners, with perspectives that flowed from their personal history and
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3 organizational context. All of this we understand as *framing the inquiry*, with these
4 elements: the invitation to inquiry, opening the experience of being in a system, and
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6 investigating what is at issue for individuals and groups with different stakeholdings.
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10 The guiding intent in framing the inquiry was to displace solution-seeking based
11 on assumptions of linear cause and effect, and put in place systemic and collaborative
12 inquiry. The invitation created a space dedicated to inquiry. The first formal activity
13 sought to open the experience of being in a complex system. We invited participants to
14 draw their experience of a system, using coloured pens and images, diagrams, words or
15 numbers to capture what the system seemed like to them. These diagrams are known as
16 rich pictures (Armson 2011). Participants shared their pictures, and found themes
17 together. Drawing is an alternative to talking, sidestepping the tendency to go to
18 established interpretations and connecting people to their embodied experience of being
19 in a system. Considering others' pictures reveals differences in perspective, rooted in
20 where a person sits within governance arrangements (Mackay 2018). People at regional
21 level, for example, experience NRM governance differently from people at local or
22 State level. Finding themes rather than issues or problems is a way to think holistically
23 about complexity, without getting overwhelmed by detail or alternatively, breaking the
24 mess into small pieces and treating the situation as a series of difficulties.
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49 Figures 4a & 4b. Rich pictures from Workshop 1.

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51 The rich pictures are mostly messy affairs (see Figure 4a), but are sometimes loosely
52 structured through use of metaphor (Figure 4b). Drawing then discussing the rich
53 pictures activates three kinds of inquiry: first-person inquiry, as I attempt to represent
54 what I experience; second-person inquiry, as I notice how others have represented my
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3 role in relation to their role and we begin to examine our relationships; and third-person
4 inquiry, as we jointly look at the institutional or organizational context in which our
5 relationships are embedded (Torbert and Taylor 2008).
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10 The next stage of the inquiry, *Focusing in*, was a search for the points in current
11 governance arrangements and practices where there was an opportunity to improve
12 governance. This was an iteration between a first guess at an opportunity, analysis of
13 patterns of behaviour, and a search for interventions where change might bring
14 improvement. We introduced participants to multi-cause diagramming (Armson 2011;
15 Open University 2019) as a way to track intended and unintended consequences through
16 networks of cause and effect, and thereby to understand practices and institutional
17 arrangements that either locked in ineffective governance or could open up effective
18 governance. Sometimes these were two sides of the same coin. Possible intervention
19 points were contested, and people worked through their differing perceptions of
20 potential for change in different aspects of governance, and their differing assumptions
21 about change. When a possibility petered out, discussion returned to the opportunity and
22 to analysis of how governance played out around that opportunity. This search for
23 intervention points also took account of what was happening at policy and operational
24 levels. For example, was now the right time to pursue a particular pathway? Was there
25 readiness amongst practitioners, policymakers and politicians? As an example of the
26 focusing in process, Figure 5 maps the thinking around the opportunity '*Co-designing
27 the partnership between community and government*'.
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54 Figure 5. Alternative ways to strengthen the community-government partnership.

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57 Regarding this opportunity, community Landcare participants said they were locked
58 into partnerships where they were informed and educated, but still essentially told what
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3 to do by government programs. They wanted partnerships where they had an equal say
4 in decisions and an equal share in the risks associated with programs and projects. But
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6 how could this be achieved? For thirty years, Landcare groups and networks had taken
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8 local action, and assumed (along the right-hand loop in Figure 5) that Landcare would
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10 be taken on by regional level as partners in planning. This had not happened.
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14 Marshalling evidence of the impacts of community action might be a way forward: on
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16 the left-hand loop, gathering evidence of Landcare's impacts and telling that story better
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18 might strengthen advocacy for people-centred policies that would compel government
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20 programs to do more than consult on their terms, when it suited them. This, however,
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22 was a long road, with many possible points where influence would fail. As the group
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24 struggled with this, a third pathway (shown by the arrows through the centre of the
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26 diagram) appeared: to take on the way priorities are set and projects designed—the nuts-
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28 and-bolts of NRM planning—and co-design these between local and regional levels.
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31 The concept of 'co-design' had recently come into policy thinking in NRM in Victoria,
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33 and might prove attractive to funders and regional players—this was the pathway this
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35 group pursued.
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40 *Moving from what is to what could be* began with *systems maps* that showed the
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42 structure of, and relationships between, parts of a system operating around a focal
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44 situation. Systems maps delineate a boundary, and internal structure of sub-systems, and
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46 an environment outside the boundary. By diagramming the systems and sub-systems
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48 that belong together, systems maps make it easier to understand what is happening
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50 (Armson 2011). *Systems definitions* then gave shape to what could be, in the form: 'A
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52 system to do <What> by means of <How> in order to contribute to achieving <Why>'.
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54 This template is disarmingly simple, with only one *What*, the primary activity that
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56 defines the purpose, and one *Why*. The '*What*' must contribute directly to the '*Why*' in
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ways that are readily understandable. Verb forms are used for *What*, *How* and *Why*. Arriving at a systems definition is a deliberative process, moving between analysis of what is and what could be (Armson 2011; Checkland and Poulter 2006).

If the systems definition sets an aspiration, a human activity system (HAS) (Checkland and Poulter 2006; Armson 2011) is a design for how to shift existing players towards a new system. The notion of an activity system displaces the assumption of predictable cause-and-effect implicit in a program logic approach to project design. Systemic co-inquiry assumes that governance can change when human actors engage creatively in reshaping practice through design, action and learning. Figure 6 reproduces the systems definition and HAS developed by the ‘*Operationalising the Victorian Biodiversity Strategy*’ co-inquiry group. Protection of biodiversity is affected by many different government agencies, businesses and individuals, but most act without knowledge of what others are doing or intending, particularly in urban areas. The experiences of the group were that government set priorities using different criteria and different data to those used by urban communities active in local nature stewardship. The urban environment was a ‘blank spot’ in State agency planning and activities, despite 90% of Victoria’s population living in urban areas.

Figure 6. A system definition and human activity system for connecting Victorians with nature

Participants felt that what was needed was change in the linkages between strategy-making, decision-making and community involvement. The *Operationalising the Victorian Biodiversity Strategy*’ co-inquiry group decided it was necessary to shift the

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3 system from government-led planning disconnected from community members who are
4 active in caring for nature, to a system that involves all Victorians working together to
5 take care of nature. This would require programs co-designed by citizens and local
6 government agencies, working collaboratively to engage their local communities in
7 nature stewardship. A project was developed and funded to initiate a network in which
8 innovators co-designing stewardship programs would share what they were doing,
9 supporting development of other co-designing citizen-local government collaborations
10 who would join the network and share their learnings and resources. This network has
11 moved knowledge and inspiration rapidly across multiple locations and organizations in
12 municipalities in and around Melbourne, and continues as an expanding self-organizing
13 governance network based on hub and spoke relationships (Gardens for Wildlife
14 Victoria 2019; Mumaw, Gaskell, and Leskovec 2018).

31 **Critical reflections on the systemic co-inquiry design and conduct**

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34 The systemic co-inquiry described above is dynamic, and exciting, and some practice is
35 changing. We now reflect on what we learned through this systemic co-inquiry in
36 relation to governance and practice, and its theoretical and political implications.
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40 ***Governance***

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43 The design led beyond articulating what was wrong in a situation of concern to a focus
44 on the opportunities perceived by those participating. Over time all members of the
45 consortium began to think of themselves as both facilitators and researchers. They
46 framed their role as providing a platform that would support autonomous teams around
47 each (sub) co- inquiry. The platform conducted a meta-inquiry into how systemic co-
48 inquiry could be sustained, institutionalised and contribute to capacity and capability-
49 building. The consortium developed a case, alongside the four pilot proposals, for
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3 funding support for such a platform, that is for moving towards and institutionalising
4 systemic governance or co-governance. Foster et al. (2019) conceptualised this function
5 in another, similar, program as inquiring into governing; a second-order, reflexive
6 institutional and praxis space capable of mediating between the arms of vertical (i.e.
7 state driven) and horizontal (i.e. civil society-driven) governance. But who, other than
8 government, might fund inquiry into governance? And if they do, are the dangers of
9 being co-opted by government outweighed by the opportunity to inquire - this is in itself
10 an area for more innovation and inquiry.
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22 *Methodological*

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25 We have seeded an approach to improving governance rooted in social learning, that
26 brings together innovators from different organizations (government and civil) at
27 different levels (local, regional and State). Beyond the first two workshops we were not
28 able to sustain participation of Federal government personnel. We set aside the
29 traditional approach to improvement of governance, in which agendas, models,
30 processes and priorities are set by government actors and opened to community actors
31 for 'consultation', often within a rigid timeframe that precludes meaningful
32 contribution. Two aspects of the case study are worth comment: the creation of a 'safe
33 space' for inquiry embedded in, but not constrained by, networks and hierarchies, and
34 the use of systems thinking in practice (STiP) to support inquiry in the context of
35 practice.
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51 The case study describes systemic co-design as a process, but the systemic
52 inquiry in NRM governance was also a 'safe space' for the creative work of systems
53 thinking. The support and imprimatur of a key, high-level government actor early on
54 assisted to validate the process, but essentially our approach was driven by an invitation
55 to people frustrated with limitations in the practices and institutional relationships of
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3 NRM, who nonetheless believed that things could be done better. Systemic co-inquiry
4 provided those people with a way to work with others to learn how to move from
5 problems to possibilities, in conditions of complexity and uncertainty, and then shape
6 their ideas into the form of ‘pilot project’ proposals which NRM organizations and
7 philanthropic funders could understand and to which they could respond.
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15 Participants were recruited from networks across NRM governance, then formed
16 as teams that linked these networks, and continued to test their ideas, influence opinion
17 and broker connections within their networks, harnessing the potential observed for
18 networks in systems change (Moore and Westly 2011). Some came from positions
19 within hierarchies, negotiating support from those hierarchies for their participation, and
20 lobbying for support for the proposals that emerged. Others came as interested civil
21 actors, linked to volunteer networks without organizational constraints. In mobilizing
22 support within networks and hierarchies, participants acted as organizational
23 entrepreneurs (Huitema and Meijerink 2010; Davidson and de Loe 2016). Systemic co-
24 inquiry was therefore *a place for inquiry*, connected to, but not assimilated by, networks
25 and hierarchies. The presence of a team of practitioners and researchers to sponsor and
26 facilitate systemic co-inquiry legitimized that place for learning and delivered the
27 guidance and practical support needed for inquiry. However, the inquiry was treated by
28 some of these hierarchies as a ‘project’ (sensu Allan 2012), supported within the period
29 of its initial resourcing but not beyond, precluding its effectiveness as an ongoing
30 iterative approach.
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51 The inquiry applied systems thinking in the context of practice. Rather than
52 seeking a perilous certainty, we encouraged engagement with differing points of view
53 that generated deeper understanding of what was possible, and commitment to pursue
54 this. By approaching systems as constructs of human purposefulness, rather than as hard
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3 objects, the inquiry supported design for change. The use of novel formulations of
4 possible systems to articulate a vision left open the realization that ongoing articulation
5 of purpose is always a matter for further inquiry and design. The use of Human Activity
6 Systems set up action as a system of influence within a complex institutional context,
7 rather than positioning action as implementation of a known program logic separate
8 from uncertainty and human agency. Understanding any situation as a manifestation of
9 practices and institutional arrangements underpinned by values and ways of thinking
10 gave participants many different entry points to bring about change. Framing change as
11 learning-in-action helped to engage people who were unfamiliar with theoretical
12 language and suspicious of imposed approaches.

27 *Theoretical*

30 Current NRM practices are habits of hand and mind, and current arrangements reflect
31 where power sits. Even when all parties are dissatisfied, it takes more than a good idea
32 to shift long-established patterns; that requires strategic action in the ‘whole system’.
33 We have demonstrated that players from civil society can continue to act, and not be
34 immediately oppressed by extant institutions. The creation of a space aligned with, but
35 not within, existing organizations and power structures provided both legitimacy and
36 freedom. Participant designers/facilitators able to foster a fractal like (or polycentric)
37 praxis network of ‘systemic (co)inquiring’ groups may be one pathway to
38 transformative social change. Effective monitoring and evaluating and adaptive
39 designing of the inquiry should become an essential part of the ongoing process.

53 The systems co-inquiry framing also re-unites, to some degree, interpretation of
54 action, practice-orientation and deliberation. Systems thinking provided a way to enter
55 into uncertainty that produced insights in support of ongoing concerted action. In this
56 regard systemic co-inquiry can be seen as a further development in the action

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3 research/systemic action research lineage of scholarship to which the authors have
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5 contributed.
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8 9 *Political*

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11 The platform enabled collaborative action that led to modest investment from numerous
12 sources, around three emergent co-inquiries, although to date it has not been possible to
13 fund the meta-inquiry. This is an ongoing challenge in a field that has been plagued
14 over many years by on-going co-option of local understandings and self-organising
15 actions by the state (Ison, Alexandra, and Wallis 2018). Through the State government
16 (DEWLP) funding we know that the systemic co-inquiries influenced the development
17 of policy, but there is no guarantee of ongoing implementation of systemic co-inquiry as
18 a policy paradigm. Our approach was sustained without specific funding or programs,
19 the initial step backed by a small university grant, with other willing to contribute as the
20 benefits of the process emerged.
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35 The systemic co-inquiry was only possible by keeping diverse stakeholders
36 engaged, trusting the process and capturing and articulating the emergent outcomes. Our
37 starting point outside established authority in NRM facilitated this, however, the overall
38 approach is likely to fail unless sustained support (from, for example, employers,
39 agencies, philanthropic bodies) for a new type of organization, based on enacting a
40 paradigm of co-inquiry/co-design, can be created. Organizations that facilitate design,
41 reflection and transformation, ahead of planning and projects, are needed to break the
42 pendulum and treadmill effects, to mediate between the arms of vertical and horizontal
43 governance while maintaining ongoing relevance and avoiding state capture. Our co-
44 inquiry was underway when co-design became flavour-of-the-month in
45 policy/government circles, and our observation was that the state continues to see itself
46 as ‘initiator’ for anything not part of its traditional role, and rather than being an
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3 ongoing collaborator, handballing actual implementation of any new design to ‘the
4 community.’ This does not bode well for state support for an approach that adds to the
5 set of co-design possibilities, a commitment to rigorous inquiry, and to iterations of
6 inquiry, design and action, rather than pursuit of single-shot solutions.
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13 **Relevance for DPA**

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16 There are clear links with DPA in the approach taken by the research
17 consortium, in particular the will to build policy from practice outwards (see Cook and
18 Wagenaar 2012), and to facilitate and foster insitutionalisation of social learning and
19 systems thinking in practice (see Foster et al. 2019; Mackay 2018). DPA, which seeks
20 to generate relevant and usable knowledge for policy actors, was originally described as
21 having three related pillars - interpretation, deliberation and practice (Hajer and
22 Wagenaar 2003). Practice in this context was considered to be pragmatic and
23 purposeful, interpretive and holistic, interactive and moral and emotional, and with a
24 systems understanding of community (Wagenaar and Cook 2003).
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36 West, van Kerhoff, and Wagenaar (2019) propose practice as a starting point for
37 transdisciplinary interventions in situations of dynamic complexity. DPA argues that
38 knowledge emerges from practice. Inquiry in the midst of practice, by people attuned to
39 the contingencies of a complex situation, is more likely to generate transformative
40 action than inquiry that assumes that knowledge precedes, and is applied to, action.
41 Complex situations change, and knowledge is but one manifestation of practice that
42 develops and is improvised in those situations. These understandings are consistent with
43 claims about practice arising from applied systems thinking in practice (STiP) research
44 at the UK Open University (OU). From the cybernetic systems and cognition lineages
45 that inform their work, practice is (i) always situated and embodied; (ii) requires an
46 observer for all observing; (iii) understands that everything said is said by someone (we
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3 live in language); (iv) accepts that all knowing is doing and that all being, knowing and
4 doing is relational and (v) appreciates that all observers, practitioners, actors have a
5 history, a tradition of understanding, out of which they think and act.
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10 While there is continued interest in, and scholarship on, DPA its three pillars
11 appear to have uncoupled, and moved in different directions (see Li and Wagenaar
12 2019b; Foster et al. 2019). The dissociation of the three pillars entrenches the tendency
13 of DPA to maintain traditional forms of research practice within the linear model of
14 ‘knowledge transfer’, with negative implications for the science of policy analysis and
15 for all societies grappling with the new normal of the Anthropocene (Ison 2018). Li and
16 Wagenaar (2019a, 580) conclude that there are many reasons for the failure of DPA to
17 be taken up as a coherent program of theory and practice, noting that the “continuing
18 hegemony of positivist, reductionist and control-oriented social science is an important
19 one”. But they also apportion blame to DPA itself for the absence of a set of operable
20 procedures that potential practitioners can take. They suggest that “Currently people
21 who are in principle sympathetic towards DPA have a hard time figuring out how to
22 actually do it.”
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40 In this paper we reflect on our experience of using a systemic co-inquiry as a
41 means to transform NRM to a form of systemic governance or governing. Describing
42 and critiquing our use of systemic co-inquiry provides new insights to address
43 challenges for future DPA, expressed by Li (2019) as: (i) how to render the DPA
44 approach more operable, (ii) the absence of “analysis,” and (iii) the lack of purposeful
45 and designed practice. This particular case demonstrates how ‘new wave’ DPA can be
46 made operable, include analysis as deliberation, and generate purposeful, designed
47 pilots. What remains in doubt, however are the means to initiate and sustain a wave of
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3 governance reform that opens up spaces for institutionalising new-wave DPA
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5 understandings and practices (see also Foster et al. 2019).
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9 **Conclusion**

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11 The case presented in this paper is situated within the broader ‘problematique’ of how
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13 to operationalise relational policy and practice development as part of a shift towards
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15 systemic/adaptive co-governance. We have demonstrated systemic co-inquiry as a
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17 practice; a pragmatic and purposeful way of approaching policy that is interpretive and
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19 holistic, and that by being interactive enables moral and emotional elements to be
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21 brought into planning. As such it can be considered to be part of the interventionist
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23 conception of DPA, that re-emphasises the centrality of practice, and gives direction to
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25 the interpretive and deliberative elements. It is, perhaps, an approach to nurture, but
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27 questions remain. In particular: What additional, complementary work is needed to
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29 create the new structures that will support on going social learning and systemic co-
30
31 inquiry? Did the constant need for funding influence the shape and direction of the
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33 systemic co-inquiry to its detriment? And perhaps most importantly, did we really jump
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35 off the treadmill, or simply spin it a bit faster?
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46 **References**

- 47
48 Allan, C. 2012. "Rethinking the ‘Project’: Bridging the Polarized Discourses in
49 IWRM." *Journal of Environmental Policy & Planning* 14 (3):231-41. doi:
50 10.1080/1523908X.2012.702012.
51
52 Allan, C., and A. Curtis. 2005. "Nipped in the bud: Why regional scale adaptive
53 management is not blooming." *Environmental Management* 36 (3):414-25. doi:
54 10.1007/s00267-004-0244-1.
55
56 Ansell, C., and A. Gash. 2007. "Collaborative Governance in Theory and Practice."
57 *Journal of Public Administration Research and Theory* 18 (4):543-71. doi:
58 10.1093/jopart/mum032.
59
60 Armson, R. 2011. *Growing wings on the way: systems thinking for messy situations*.
Triarchy Press Limited.

- 1
2
3 Bates, G. 2006. *Environmental Law in Australia*. 6th ed. Chatswood, Australia:
4 LexisNexis Butterworth's.
- 5 Blackmore, C. 2009. "Learning Systems and Communities of Practice for
6 Environmental Decision-Making." The Open University.
- 7 Blackmore, C., N. Foster, K. Collins, and R. L. Ison. 2017. "Understanding and
8 developing communities of practice through diagramming." In *Mapping
9 environmental sustainability: reflecting on systemic practices for participatory
10 research*, edited by S. Oreszczyn and A Lane, 155-82. London: Policy Press.
- 11 Brunner, R. D., and T. A. Steelman. 2005. "Beyond scientific management." In
12 *Adaptive Governance: Integrating Science, Policy and Decision-Making*, edited
13 by Ronald D. Brunner, Toddi A. Steelman, Lindy Coe-Juell, C. M. Cromley,
14 Edwards C.M. and Donna W. Tucker, 1-46. New York: Columbia University
15 Press.
- 16 Checkland, P. 2002. "The Role of the Practitioner in a Soft Systems Study: Notes of a
17 Talk given to OuSyS and UKSS, Saturday 8th December 2001." *Quarterly
18 Newsletter of the Open University Systems Society*:S5-11.
- 19 Checkland, P., and J. Poulter. 2006. *Learning for Action: A Short Definitive Account of
20 Soft Systems Methodology and its Use, for Practitioners, Teachers and Students*
21 Chichester: John Wiley and Sons Ltd
- 22 Churchman, C. W. 1971. *The Design of Inquiring Systems*. New York: Basic Books.
- 23 Collins, K., and R. L. Ison. 2010. "Trusting Emergence: Some Experiences of Learning
24 about Integrated Catchment Science with the Environment Agency of England
25 and Wales." *Water resources management* 24:669-88. doi: DOI
26 10.1007/s11269-009-9464-8.
- 27 Colliver, R. 2012. "Community-based governance in social-ecological systems: an
28 inquiry into the marginalisation of Landcare in Victoria, Australia." Murdoch
29 University.
- 30 Cook, S. D. N., and H. Wagenaar. 2012. "Navigating the Eternally Unfolding Present:
31 Toward an Epistemology of Practice." *The American Review of Public
32 Administration*:1-36. doi: 10.1177/0275074011407404.
- 33 Curtis, A. 1998. "Agency-Community Partnership in Landcare: Lessons for State-
34 Sponsored Citizen Resource Management." *Environmental Management* 22
35 (4):563-74.
- 36 Curtis, A., and M. Lockwood. 2000. "Landcare and Catchment Management in
37 Australia: Lessons for State-Sponsored Community Participation." *Society &
38 Natural Resources* 13 (1):61-73. doi: 10.1080/089419200279243.
- 39 Curtis, A., H. Ross, G. R. Marshall, C. Baldwin, J. Cavaye, C. Freeman, A. Carr, and G.
40 J. Syme. 2014. "The great experiment with devolved NRM governance: lessons
41 from community engagement in Australia and New Zealand since the 1980s."
42 *Australasian Journal of Environmental Management* 21 (2):175-99. doi:
43 10.1080/14486563.2014.935747.
- 44 Davidson, S. L., and R. C. de Loe. 2016. "The Changing Role of ENGOs in Water
45 Governance: Institutional Entrepreneurs?" *Environ Manage* 57 (1):62-78. doi:
46 10.1007/s00267-015-0588-8.
- 47 Dewey, J. 1933. *How we think : a restatement of the relation of reflective thinking to the
48 educative process*. Boston, N.Y.: D.C.Heath and co.
- 49 Foster, N., R. L. Ison, C. Blackmore, and K. Collins. 2019. "Revisiting deliberative
50 policy analysis through systemic co-inquiry: some experiences from the
51 implementation of the Water Framework Directive in England." *Policy
52 Studies*:1-24. doi: 10.1080/01442872.2019.1618816.
- 53
54
55
56
57
58
59
60

- 1
2
3 Gardens for Wildlife Victoria. 2019. "Gardens for Wildlife Victoria." Accessed 30
4 August. <https://gardensforwildlifevictoria.com/>.
- 5 Hajer, M., and H. Wagenaar. 2003. "Deliberative policy analysis : understanding
6 governance in the network society." In. Cambridge, UK: Cambridge University
7 Press.
- 8
9 Head, B. W. 2009. "From government to governance: explaining and assessing new
10 approaches to NRM." In *Contested Country: local and regional natural
11 resource management in Australia*, edited by M Lane, C. J. Robinson and B.
12 Taylor, 15-28. Canberra: CSIRO Publishing.
- 13 Heron, J., and P. Reason. 2001. "The Practice of Co-Operative Inquiry. Research with
14 Rather than on People." In *Handbook of Action Research*, edited by Peter
15 Reason and Hilary Bradshaw, 179–88. London: Sage Publications.
- 16 Huitema, D., and S. Meijerink. 2010. "Realizing water transitions: The role of policy
17 entrepreneurs in water policy change." *Ecology and society* 15.
- 18 Innes, J. E., and D. E. Booher. 2016. "Collaborative rationality as a strategy for working
19 with wicked problems." *Landscape and Urban Planning* 154:8-10. doi:
20 10.1016/j.landurbplan.2016.03.016.
- 21
22 Ison, R. L. 2002. "Some reflections on a knowledge transfer strategy: a systemic
23 inquiry." In *Farming and Rural Systems Research and Extension, Proceedings
24 Fifth IFSA European Symposium*. Florence.
- 25 ———. 2017. *Systems Practice: How to Act. In Situations of Uncertainty and
26 Complexity in a Climate-Change World*. London: Springer.
- 27 ———. 2018. "Governing the human–environment relationship: systemic practice."
28 *Current Opinion in Environmental Sustainability* 33:114-23. doi:
29 10.1016/j.cosust.2018.05.009.
- 30
31 Ison, R. L., J. Alexandra, and P. J. Wallis. 2018. "Governing in the Anthropocene: are
32 there cyber-systemic antidotes to the malaise of modern governance?"
33 *Sustainability Science*. doi: 10.1007/s11625-018-0570-5.
- 34 Ison, R. L., C. Allan, and K. Collins. 2015. "Reframing water governance praxis: Does
35 reflection on metaphors have a role?" *Environment and Planning C:
36 Government and Policy* 33 (6):1697-713. doi: 10.1177/0263774X15614466.
- 37 Ison, R. L., N. Röling, and D. Watson. 2007. "Challenges to science and society in the
38 sustainable management and use of water: investigating the role of social
39 learning." *Environmental Science & Policy* 10 (6):499-511. doi:
40 10.1016/j.envsci.2007.02.008.
- 41 Ison, R. L., P. Steyaert, P. P. Roggero, B. Hubert, and J. Jiggins. 2004. *Social Learning
42 for the Integrated Management and Sustainable Use of Water at Catchment
43 Scale*. Milton Keynes: The Open University. <http://oro.open.ac.uk/2839/>.
- 44 Ison, R. L., and E. Straw. 2020. *Crafting Governance Fit for the Anthropocene. The
45 Hidden Power of Systems Thinking in Practice*. Abingdon: Routledge.
- 46 Jennings, S., and S. Moore. 2000. "The rhetoric behind regionalization in Australian
47 natural resource management: myth, reality and moving forward." *Journal of
48 Environmental Policy & Planning* 2 (3):177-91. doi: 10.1080/714038553.
- 49 Li, Y. 2019. "Deliberative policy analysis: towards a methodological orientation."
50 *Policy Studies* 40:437-55.
- 51 Li, Y., and H. Wagenaar. 2019a. "Conclusion: building new momentum for deliberative
52 policy analysis." *Policy Studies* 40:580-4. doi:
53 10.1080/01442872.2019.1618814.
- 54 ———. 2019b. "Revisiting deliberative policy analysis." *Policy Studies* 40:427-36.
55 doi: 10.1080/01442872.2019.161881.
- 56
57
58
59
60

- 1
2
3 Lockie, S. 1998. "Landcare in Australia: Cultural Transformation in the management of
4 rural environments." *Culture and Agriculture* 20 (1):21-9.
- 5 Lockwood, M., and J. Davidson. 2010. "Environmental governance and the hybrid
6 regime of Australian natural resource management." *Geoforum* 41 (3):388-98.
7 doi: <http://dx.doi.org/10.1016/j.geoforum.2009.12.001>.
- 8
9 Lockwood, M., D. Julie, A. Curtis, E. Stratford, and R. Griffith. 2009. "Multi-level
10 Environmental Governance: lessons from Australian natural resource
11 management." *Australian Geographer* 40 (2):169-86.
- 12 Mackay, M. 2018. "Transforming governance together: A co-inquiry into practices for
13 transitioning from top-down to adaptive co-governance." Charles Sturt
14 University.
- 15 Mackay, M., C. Allan, R. Colliver, and J. Howard. 2014. "Systems Approaches Enable
16 Improved Collaboration in Two Regional Australian Natural Resource
17 Governance Situations." *International Journal of Systems and Society* 1 (2):1-
18 21. doi: 10.4018/ijss.2014070101.
- 19 Marshall, G. R. 2008. "Nesting, Subsidiarity, and Community-based environmental
20 Governance beyond the Local Scale." *International Journal of the Commons* 2
21 (1):75-97. doi: <http://doi.org/10.18352/ijc.50>.
- 22 ———. 2009. "Polycentricity, reciprocity, and farmer adoption of conservation
23 practices under community-based governance." *Ecological Economics* 68:1057-
24 520.
- 25 Moore, M.-L., and F. Westly. 2011. "Surmountable chasms: networks and social
26 innovation for resilient systems." *Ecology and society* 16 (1).
- 27 Morrison, T., and M. Lane. 2006. "The convergence of regional governance discourses
28 in rural Australia: enduring challenges and constructive suggestions." *Rural
29 Society* 16 (3):341-57.
- 30 Mumaw, L., and S. Bekessy. 2017. "Wildlife gardening for collaborative public-private
31 biodiversity conservation." *Australasian Journal of Environmental
32 Management* 24 (3): 242-60.
- 33 Mumaw, L., N. Gaskell, and C. Leskovec. 2018. From planning to wildlife gardening:
34 evolving approaches to fostering urban biodiversity. Paper presented at the
35 Remaking Cities - Proceedings of the 14th Australasian Urban History Planning
36 History Conference, Melbourne. Australasian Urban History Planning History
37 Group and the RMIT Centre for Urban Research.
- 38 Norton, B. G. 2005. *Sustainability: A Philosophy of Adaptive Ecosystem Management*.
39 Chicago: The University of Chicago Press.
- 40 Open University. 2019. "Systems diagramming. OpenLearn." Accessed 28 August
41 2019. [https://www.open.edu/openlearn/science-maths-technology/computing-
42 and-ict/systems-computer/systems-diagramming/content-section-4.1](https://www.open.edu/openlearn/science-maths-technology/computing-and-ict/systems-computer/systems-diagramming/content-section-4.1)
- 43 Prager, K. 2010. "Local and Regional Partnerships in Natural Resource Management:
44 The Challenge of Bridging Institutional Levels." *Environmental Management*
45 46 (5):711-24. doi: 10.1007/s00267-010-9560-9.
- 46 Robins, L., and S. Dovers. 2007. "NRM Regions in Australia: the "Haves" and the
47 "Have Nots"." *Geographical Research* 45 (3):273-90.
- 48 Robins, L., and P. Kanowski. 2011. "'Crying for our Country': eight ways in which
49 'Caring for our Country' has undermined Australia's regional model for natural
50 resource management." *Australasian Journal of Environmental Management* 18
51 (2):88-108. doi: 10.1080/14486563.2011.566158.
- 52 Rockström, J., W. Steffen, K. Noone, Å. Persson, S. F. Chapin, E. F. Lambin, T. M.
53 Lenton, et al. 2009. "A safe operating space for humanity." *Nature* 46.
- 54
55
56
57
58
59
60

- 1
2
3 Russell, D. B., and R. L. Ison. 2007. "The research-development relationship in rural
4 communities: an opportunity for contextual science." *Agricultural extension*
5 *and rural development: Breaking out of knowledge transfer traditions*:10-31.
6 Schön, D. A. 1973. *Beyond the stable state : public and private learning in a changing*
7 *society*. Harmondsworth: Penguin.
8 Stephens, M. 2013. "Translation of national environmental management programs by
9 the State of Western Australia, the Commonwealth government, and Perth
10 Region NRM, a citizen group." Curtin University.
11 Steyaert, P., and J. Jiggins. 2007. "Governance of complex environmental situations
12 through social learning: a synthesis of SLIM's lessons for research, policy and
13 practice." *Environmental Science & Policy* 10 (6):575-86. doi:
14 10.1016/j.envsci.2007.01.011.
15 Tennent, R., and S. Lockie. 2013. "Vale Landcare: the rise and decline of community-
16 based natural resource management in rural Australia." *Journal of*
17 *Environmental Planning and Management* 56 (4):572-87. doi:
18 10.1080/09640568.2012.689617.
19 Torbert, W., and S. Taylor. 2008. "Action Inquiry: interweaving multiple qualities of
20 attention in timely action " In *In The Handbook of Action Research*, edited by P.
21 Reason and Hilary Bradbury, 239-51. London: Sage.
22 Wagenaar, H., and S. D. N. Cook. 2003. "Understanding policy practices: action,
23 dialectic and deliberation in policy analysis." In *Deliberative Policy Analysis:*
24 *Understanding governance in the network society*, edited by Hendrik Wagenaar
25 and Maarten Hajer, 139-71. Cambridge: Cambridge University Press.
26 Wallis, P. J., and R. L. Ison. 2011. "Appreciating institutional complexity in water
27 governance dynamics: a case from the Murray-Darling Basin, Australia." *Water*
28 *resources management*:1-17.
29 West, S., L. van Kerhoff, and H. Wagenaar. 2019. "Beyond "Linking" Knowledge and
30 Action: Towards a Practice-Based Approach to Transdisciplinary Sustainability
31 Interventions " *Policy Studies* 40 (5):534-55. doi:
32 doi:10.1080/01442872.2019.1618810.
33 Youl, R., L. Polkinghorne, T. Naben, and S. Marriott. 2001. *Landcare in*
34 *Australia:founded on local action*. Melbourne: Landcare Foundation Victoria.
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45 ⁱ NRM Regions Australia, <https://nrmregionsaustralia.com.au/what-is-nrm/> Accessed 20th
46 August 2019.

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48 ⁱⁱ It can be argued that a NRM framing conserves the human-nature dualism, as do recent shifts
49 to natural capital and the framing of parts of the biosphere as assets for human
50 exploitation, or interventions to conserve ecological functioning. The shift to NRG does
51 not escape the dualism but does introduce a practitioner(s) who, in the shift from
52 management to governing, creates possibilities for a shift towards praxis i.e., theory-
53 informed practical action (see Ison Alexandra and Wallis 2018).
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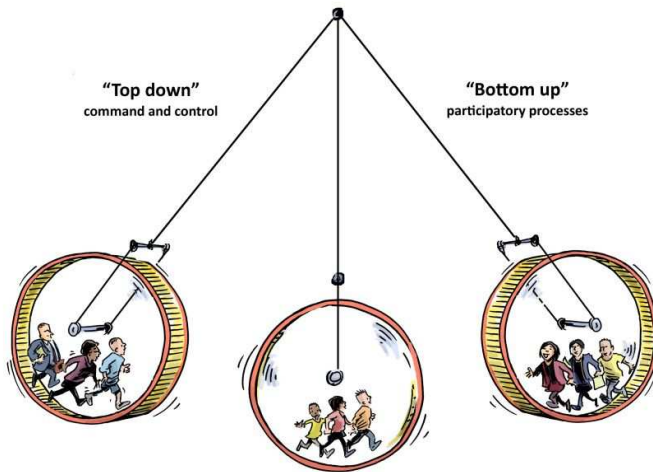


Figure 1. The pendulum swing of governance and the constant treadmill of activity that achieves little

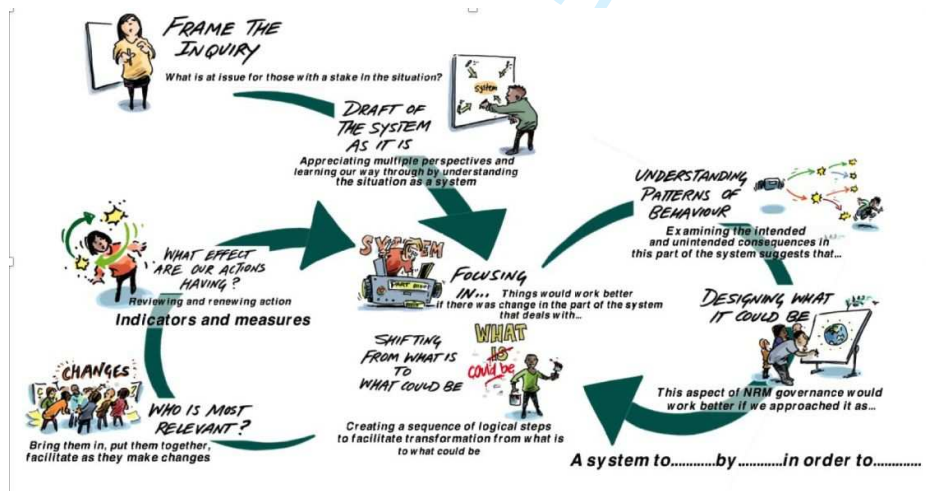


Figure 2. The design for the systemic co-inquiry, adapted from Mackay (2018)

Systemic co-inquiry into NRM governance

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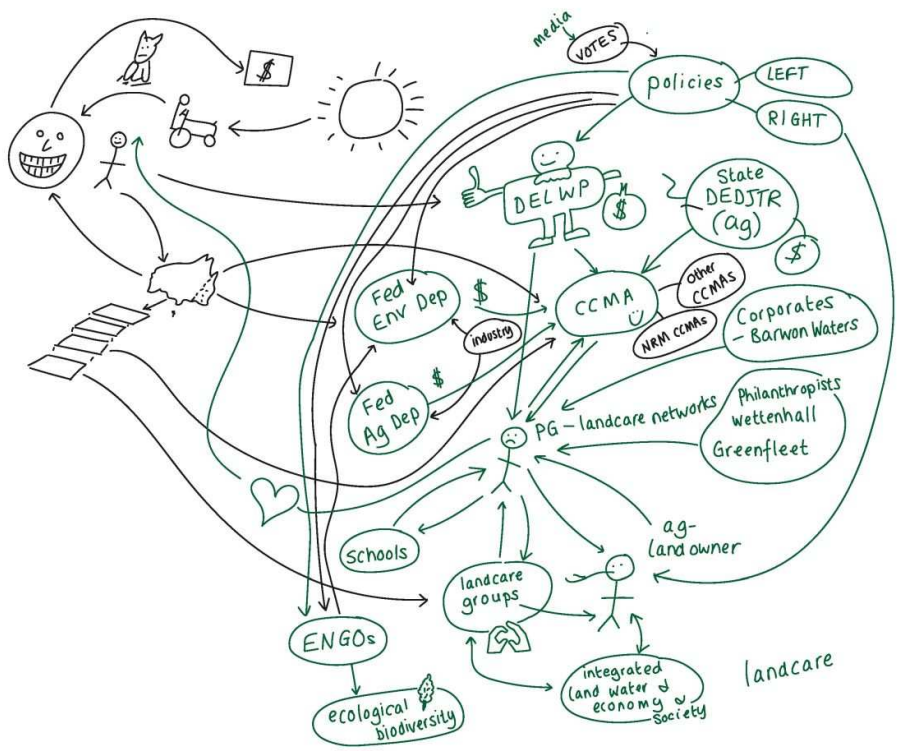


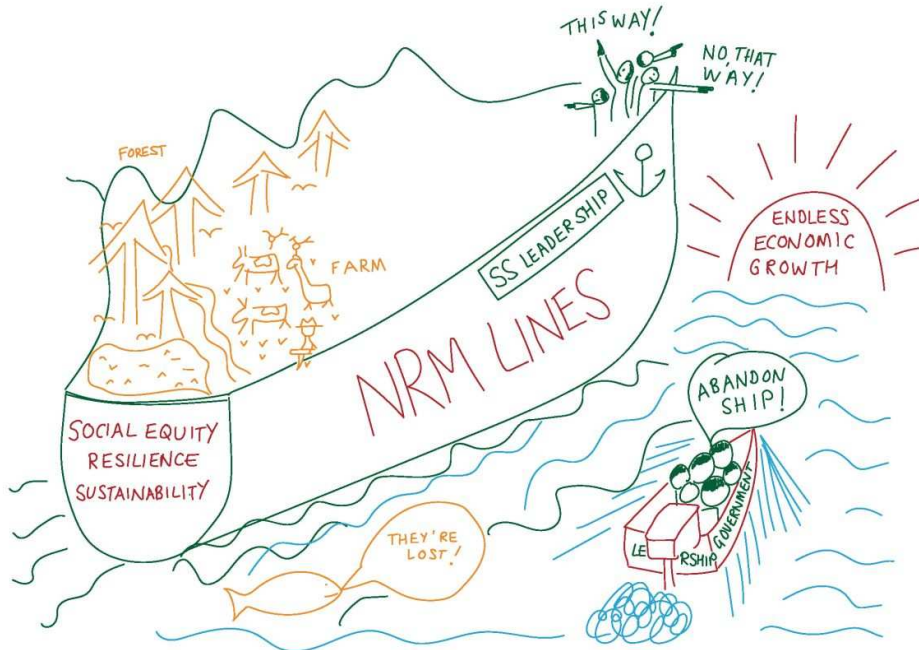
Systems Thinking
approaches

Co-inquiries **5** Workshops
Proposals 45 participants from all levels of NRM

-  Operationalising the Victorian Biodiversity Strategy
-  Integrating NRM planning across local, regional and state scales
-  Creating a common language for measuring NRM
-  Co-designing the partnership between community and government
-  A platform for Systemic Inquiry and NRM governance innovation

Figure 3. Five opportunities in the Systemic Inquiry into NRM Governance





Figures 4a & 4b. Rich pictures from Workshop 1.

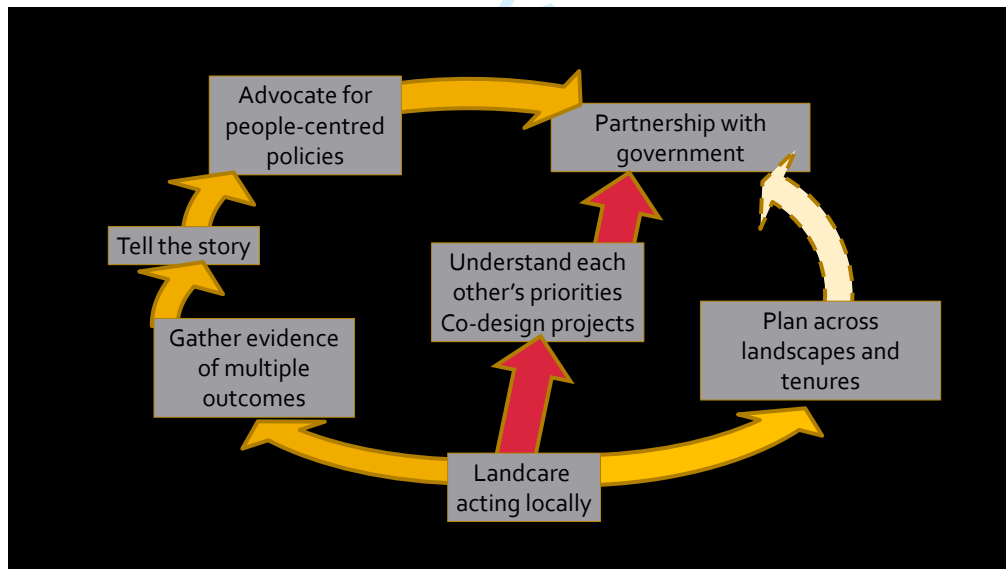
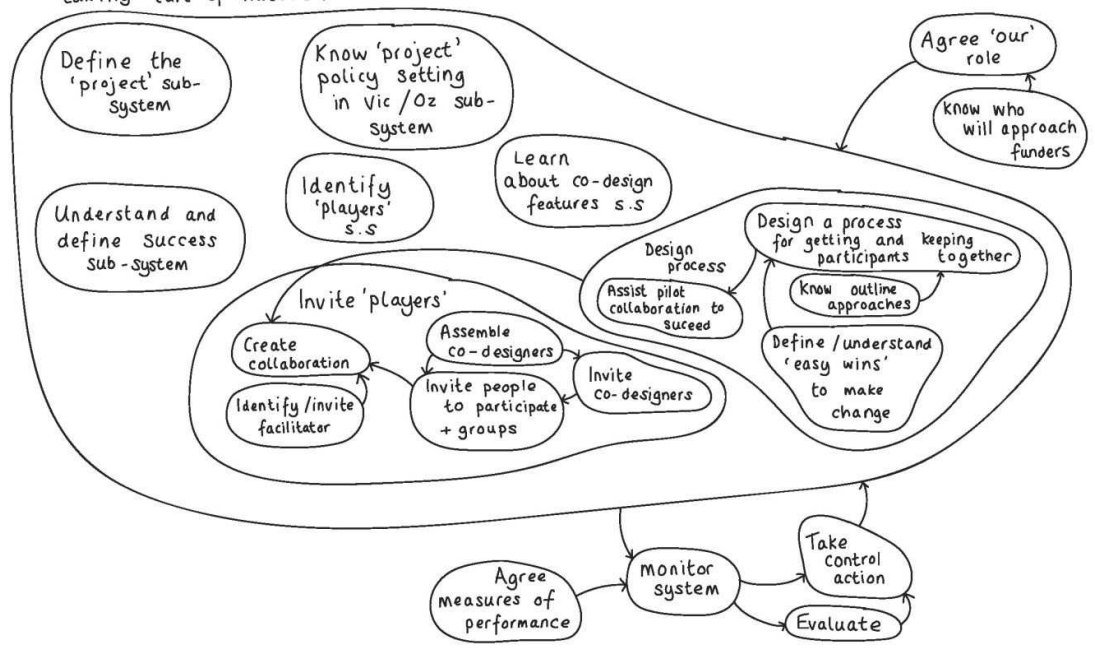


Figure 5. Alternative ways to strengthen the community-government partnership.

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4 A system to invest in pilots to co-design collaborative approaches
5 for government agencies and urban/peri-urban groups active in
6 nurturing nature in order to involve Victorians in connecting with and
7 taking care of nature.



31
32 Figure 6. A system definition and human activity system for connecting Victorians with
33 nature
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Review Only

Jumping off the treadmill: transforming NRM to systemic governing with systemic co-inquiry

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(See endnotes)

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26 **Notes on Contributors**

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31
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33 Moragh's work continues to focus on the practice of collaborative governing through
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35 application of systemic co-inquiring and mindfully employing practices that support
36
37 participants to develop systems capability beyond the direct engagement in workshops and
38
39 meetings. The NRM systemic co-inquiry discussed in this paper and the methodological
40
41 application of the systemic co-inquiry process emerged from Moragh's PhD research.
42
43

44
45 Moragh currently works in a government authority specifically designed to facilitate the
46
47 transition of a region from dependence on the fossil fuel industry as coal fired power stations
48
49 have and continue to shut down; where systems thinking and collaborative governing are
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51 everyday practice.
52
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5 arrangements. His recent work supports innovation in NRM governance between
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8
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50 refereed papers, 70+ other publications, 7 journal special editions and has been an invited
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