

Systemic Evaluation of Community Environmental Management Programmes

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Abstract

Community environmental management (CEM) involves the facilitation of community partnerships, local dialogue, consultation and participative decision-making. This is increasingly seen as a solution to some of the more complex environmental issues faced by regulatory authorities. Anecdotal evidence suggests that CEM programmes have much potential, but the evaluation of them is problematic. This paper reports on the development of a new CEM evaluation approach (inspired by soft systems methodology, developmental work research and systemic intervention), which was trialled with a New Zealand regional council. The approach shows promise in addressing common evaluation bottlenecks and helping stakeholders to develop causal narratives that more fully account for the complex relationship between community participation and environmental outcomes. While the local participants in the CEM initiative acted on the evaluation findings, they hoped that it would stimulate wider organisational change, and this did not happen. Project reflections, informed by institutional theory, reveal that the logics of ‘participation’ and ‘community’ implicit in the findings were appropriate for local participants, but non-participating regional council stakeholders read the findings with different logics, and therefore the evaluation failed to communicate the necessity for wider change. The reflections highlight a previously unrecognised evaluation bottleneck. While the CEM evaluation methodology has the potential to be adapted for other contexts, there is a need for more robust evidence of the value of CEM. However, if wider organisational change is required, care must be taken to anticipate the different institutional logics of stakeholders who might be unfamiliar with, or even hostile to, CEM.

Keywords: problem structuring methods, community environmental management (CEM), community operational research, systemic evaluation, systems thinking.

1. Introduction

Building an evidence base for the effectiveness of Community Environmental Management (CEM) programmes is a critical concern for environmental planners and managers who are increasingly relying on participative approaches to address wicked environmental problems (Hjortsø, 2004; Gregory, Atkins, Burdon & Elliott, 2013; Head and Xiang, 2016). In this paper, we describe the development of a systemic CEM evaluation methodology, and we investigate the extent to which the approach overcame various bottlenecks to the co-production and utilisation of evaluation findings in the context of a New Zealand regional council with statutory responsibilities for addressing various environmental issues.

The operational research and environmental management agenda (or ‘Green OR’ agenda, for short) has noted the importance of developing “...OR to make it more relevant to environmental planning and management...” (Midgley & Reynolds, 2004a, p.297). Midgley and Ochoa-Arias (2004) treat Green OR as an extension of Community OR, but Ife and Tesoriero (2006, p.89) point out that “both an ecological perspective and a social justice / human rights perspective are necessary for the re-evaluation of the other”, adding that these two perspectives are “readily compatible”. We agree with Ife and Tesoriero (2006), and take the view that environmental management can be strengthened through the adoption of community development principles, methodologies and methods. While both community development and Community OR practitioners share common interests in “application, transdisciplinarity and action research” (Midgley, Johnson & Chichirau, 2018, p.722), we posit that Community OR’s strength in developing methodological tools has much to offer CEM programme evaluations.

In Community OR, methodological pluralism (sometimes called multi-methodology) is commonly practiced (e.g., Jackson, 1987a, 1988; Midgley, 2000; Gregory & Jackson, 1992a,b; Boyd, Brown & Midgley, 2004; Boyd, Geerling, Gregory, Kagan, Midgley et al, 2007; Burns, 2018; Helfgott, 2018; Pinzon-Salcedo & Torres-Cuello, 2018). This is particularly relevant to CEM programme evaluations because there are so often multiple, interrelated issues to be addressed (some technical, and others concerned with stakeholder conflict), making mixed-method evaluation designs particularly useful. Of course, choosing between diverse methodologies, integrating them, and mixing methods have all been widely discussed in the general OR literature, not just in relation to community applications (for some pioneering writings on this, see, e.g., Jackson and Keys, 1984; Jackson, 1987b,c, 1991, 2000, 2003, 2019; Keys, 1988; Midgley, 1989, 1992, 2000, 2001; Flood, 1990; Flood & Jackson, 1991; Gregory, 1992, 1996; Flood & Romm, 1996; Mingers & Brocklesby, 1996; Mingers & Gill, 1997; and Midgley, Nicholson & Brennan, 2017).

Green OR examples of methodological pluralism include Hepi, Foote, Marino, Rogers & Taimona (2007), who combined Kaupapa Māori methods (research methods designed by Māori, for Māori) with Checkland’s (1981) rich picturing technique to negotiate the boundaries of an evaluation of a safe drinking water project with an indigenous community in New Zealand. Foote, Gregor, Hepi, Baker, Houston et al (2007) drew on surveying, scenario planning and soft systems methodology to participatively reframe stakeholder understandings of a 30-year conflict over water shortages in a small seaside community. Also, Winstanley, Ahuriri-Driscoll, Hepi, Baker & Foote (2016) designed a new problem structuring method to make visible the diverse community values associated with contested plans to build a water storage dam in a rural community, and they prefaced the participative use of this new method with a survey of local families to both capture information about values associated with the rivers and stimulate the interest of ordinary citizens in engaging with the problem structuring. There are many more examples in the literature. Indeed, following Midgley and Reynolds (2001, 2002, 2004a,b), we suggest that informing environmental planning and management with a Community OR approach holds much potential to enrich wider OR theory and practice. To this end, we present an example of how the kinds of OR methods that have traditionally been employed to support social interventions in communities (e.g., Ritchie, Taket &

Bryant, 1994; Midgley & Ochoa-Arias, 2004; Johnson, Midgley, Wright & Chichirau, 2018) were used as part of an evaluation to generate a local evidence-base for the assessment of a CEM programme in Canterbury, New Zealand.

Our approach to CEM evaluation was developed by blending methods from existing systems methodologies to encourage learning at individual, group, institutional and multi-agency scales. This work was carried out as part of a larger research programme that aimed to develop systemic and participative methods to strengthen community involvement in environmental decision-making for sustainable development (see Midgley, Cavana, Brocklesby, Foote, Ahuriri-Driscoll et al, 2013, and Winstanley, Ahuriri-Driscoll, Hepi, Baker and Foote, 2016, for other aspects of this programme).

Our contribution is threefold. First, the ‘wickedness’ (or complexity and multiple perspectives) associated with CEM programmes makes it unlikely that any given (essentially ‘off the shelf’) evaluation methodology will be responsive to all local needs and priorities, including the varying capacities of stakeholders. A lack of responsiveness to the complexities of the context can lead to evaluation bottlenecks, including the burden of participation falling on community stakeholders who give up precious time but do not experience sufficient benefit to make the sacrifice worthwhile, power relations making people sceptical of the value of participation, and the consequent difficulties of ongoing stakeholder engagement (e.g. Parkison, 2009; Baur, van Elteren, Nierse & Abma, 2012). All these bottlenecks reduce the effectiveness of participatory evaluations. In our project, we drew on Midgley’s (2000) systemic intervention approach (particularly boundary critique and the creative design of methods) to develop a systemic CEM evaluation methodology that was responsive to the relevant social, cultural and political contexts, and which therefore addressed these evaluation bottlenecks.

Our second contribution relates to the fact that there is usually an asymmetric and uncertain relationship between community participation and environmental outcomes (Reed, 2008), and this means that any evaluation findings will necessarily be based on partial participant perspectives (Reynolds, Gates, Hummelbrunner, Marra & Williams, 2016). The word ‘partial’ here has two meanings, and both are relevant: the participant perspectives are partial in the sense that they reduce the complexity of causation to tell a coherent story, often with the story teller’s own agency at its heart; and they are also partial in the sense that they tell that story from a normative, value-laden standpoint, which will inform what are seen as successes and failures. Evaluators must therefore create causal narratives (Gysen, Bruyninckx & Bachus, 2006) that link participation with outcomes, and must also carefully attend to the credibility, salience and legitimacy of those narratives among evaluation users. This care is important, as causal attribution can mask “the presence of an attributor ... [who is] responsible for *selecting* and then *attributing* causality” (Reynolds et al, 2016, p.633, italics in the original). If evaluation users do not find the attribution of causality credible, they could well be alienated by the findings, especially if (as is often the case) that causality is presented as an objective fact. Our systemic CEM evaluation methodology provides a structured way to help stakeholders co-create causal narratives that more fully account for relationships between community participation and environmental outcomes, including the various stakeholder tensions that limit CEM effectiveness.

Our third and final contribution concerns our reflections on this CEM evaluation. We draw on institutional theory (Thornton, Ocasio & Lounsbury, 2012; Gomes, Hermans & Thissen, 2018) to examine the role that different institutional

logics of ‘community’ and ‘participation’ played in shaping the co-creation of causal narratives, and how these were received by wider stakeholders, which ultimately influenced the acceptability (or not) of the evaluation findings beyond our participants. These reflections help to explain why our CEM evaluation was well received and acted upon by our participants, but did not stimulate the wider organisational change that those participants had hoped for. In retrospect, we argue that ensuring an evaluation is informed by institutional theory from the start could help OR practitioners anticipate how certain framings of the findings might be received by different stakeholders, thus improving communications and the likelihood of desired change.

The paper is structured into five parts. It begins by describing the role that local government plays in managing natural resources in New Zealand, and how a regional council (Environment Canterbury) institutionalised CEM in the form of ‘resource care’. The paper then sets out a number of methodological challenges to evaluating resource care activities. Encountering these challenges led the research team to develop an evaluation approach based on a synthesis of principles and methods from Soft Systems Methodology (Checkland & Poulter, 2006) and Developmental Work Research (Engeström, 2005), which were brought together in the context of Midgley’s (1997, 2000) creative design of methods. This systemic CEM evaluation methodology is then outlined, and its use in Canterbury-based workshops with resource care staff, community stakeholders and Māori (indigenous New Zealanders) is described. A more detailed analysis follows, focusing on two major conflicts that impeded resource care work in Canterbury, and how our evaluation methodology supported people in addressing them. The paper concludes by considering the contribution that systemic evaluation has made to the development of CEM in Canterbury, and the potential for adapting the methodology for other contexts where more robust evidence of the value (or otherwise) of CEM is needed.

2. Community Environmental Management

CEM is based on notions of participatory practice and aims to bring about both social and environmental outcomes through methods such as community meetings and action planning to enhance the management of natural resources. It first gained popularity in the 1960s and early 1970s amidst growing disillusionment with narrowly focused mainstream environmental management, which emphasised large-scale, capital-intensive, centrally-planned conservation and development projects (Kellert, Mehta, Ebbin & Lichtenfeld, 2000; Kapoor, 2001). It seeks to invoke traditional local and indigenous cultural and institutional mechanisms for managing and conserving the environment (Kellert et al, 2000). CEM is increasingly seen as a solution to some of the more complex environmental issues facing regulatory authorities, because the enforcement of externally imposed regulation often meets with resistance, while engaging people in finding their own solutions is more likely to galvanise community support (Martin, 1991; Seyfang & Smith, 2007). This approach has been associated with a number of positive outcomes, including increased environmental awareness; community capacity building and empowerment; improved community-government relationships; and sometimes a more equitable distribution of resources (Curtis & Lockwood, 2000; Kellert et al, 2000; Buchy & Race, 2001; McCallum, Hughey & Rixecker, 2007).

Looking beyond CEM's "compelling and convincing" rationale (Kellert et al, 2000, p.705), it nevertheless has to be acknowledged that there can be difficulties in maintaining meaningful community participation, and concerns have been expressed that some CEM programmes have privileged socioeconomic imperatives at the expense of environmental objectives (Kellert et al, 2000; Buchy & Race, 2001; McCallum et al, 2007). These authors have all called for research and evaluation to critically assess the outcomes of different forms of participation. However, the evaluation of CEM programmes is notoriously difficult (Bellamy, Walker, McDonald & Syme, 2001), given the problematic relationship between community participation and environmental outcomes (Reed, 2008): it is often impossible to demonstrate a direct, causal impact of management actions on biophysical and social outcomes because so many other contextual factors come into play (Kellert et al, 2000; Buchy & Race, 2001; McCallum et al, 2007; Patton, 2010; Sager & Andereggen, 2012; Bressers & Gerrits, 2015). Although CEM programmes promise much (Zanetell & Knuth, 2004), the lack of a robust evidence-base (Dunkley & Franklin, 2017) means that their role in resource management is often not well understood or well integrated with other environmental management tools and processes (Alexander, Andrachuk & Armitage, 2016).

Evaluation is a key to strengthening the evidence base associated with CEM (Dunkley & Fanklin, 2017). Community environmental initiatives are evaluated using a range of approaches, including both theory-driven (e.g., Chen, 1994) and constructivist ones (e.g., Guba & Lincoln, 1989). The former type of evaluation focuses on defining the theory of change that informs CEM, and it then investigates whether there is evidence for this theory. A constructivist evaluation, in contrast, looks at the subjective and inter-subjective meanings and value of a CEM programme to local stakeholders. Stakeholder participation is common, and a number of participatory methodologies have been developed to engage stakeholders in evaluative activities (Chouinard & Milley, 2018).

Community environmental programmes are characterised by complexity, uncertainty and (sometimes) conflict, which create challenges for evaluations. For example, Gysen et al (2006) highlight the ways in which complex patterns of impact and causation, combined with knowledge deficits, lack of data, time delays, political thresholds and the uneven distribution of benefits and costs, combine to frustrate evaluation activities. Hermans, Naber and Enserink (2012) note that a poor understanding of context can lead to problems with attributing cause and effect, and both Douthwaite and Hoffecker (2017) and Brauer (2018) reflect on the inadequacies of logic models and theories of change that assume linear cause and effect relationships. Of course, accounting for causality has long been a feature of evaluation theorising and practice (Brousselle & Buregeya, 2018), with a concern for identifying mechanisms (e.g., Astbury and Leeuw, 2010), alternative explanations (Mayne, 2011) and influencing factors (Pawson, Greenhalgh & Harvey, 2004).

Power relations also influence the form and substance of monitoring and evaluation systems (Hermans et al, 2012). Participatory evaluations have been criticised for ignoring how power relations shape participation (e.g., Parkinson, 2009; Baur et al, 2010). As Weiss (1973) points out, politics is an inevitable part of evaluative practice. Likewise, Hermans et al (2012) caution against using participatory evaluation as a 'silver bullet' to address the problem of multi-actor complexity, noting that evaluative activities are "not neutral learning processes, but are inherently political" (p.428). The boundaries of

an evaluation inevitably have significant implications, especially for marginalised groups whose interests and values may not be taken into account (Midgley, 2006; Boyd et al, 2007; Schwandt & Gates, 2016).

In response to these issues, a number of authors have developed methodologies that take complexity, uncertainty and conflict seriously. Hermans et al (2012), for example, combine stakeholder analysis, cognitive mapping and strategic assumption surfacing methods to develop a monitoring and evaluation framework that facilitates adaptive policy making in multi-stakeholder contexts. Gysen et al (2006) use an approach to causal narrative reconstruction that enables data about effectiveness to be organised in a way that highlights causal relationships between environmental policies and outcomes.

Our own approach is intended to illustrate the way in which two aspects of Midgley's (2000) systemic intervention – boundary critique and the creative design of methods – can be drawn upon to develop a CEM evaluation methodology that is not only theoretically and methodological robust, but also responsive to the local context, including power relationships, which infuse evaluative practice and govern the legitimacy of causal narratives linking community engagement and resource care activities with environmental outcomes.

3. The context of our project

3.1. CEM at Environment Canterbury, New Zealand

Under the Resource Management Act (1991), local government in New Zealand is responsible for the sustainable management of natural resources, including water, land and air. Environment Canterbury is one of the largest regional councils in the country, and is specifically charged with achieving “sustainable environment and sustainable communities, for the benefit of people, communities and future generations, at a reasonable level of monetary and personal costs” (Environment Canterbury, 2009). Regional councils are required to prepare policy statements and plans that set out objectives and rules to protect the environment, and they are tasked with identifying when environmental permits are required for development activities that may have environmental impacts. In addition to statutory mechanisms, non-statutory tools, such as education and CEM, are also employed to achieve outcomes (Ministry for the Environment, 2009).

At the time of our intervention, Environment Canterbury's approach to CEM was called 'resource care'. Beginning in 1999, the Resource Care Section (RCS) developed and piloted a community-based approach to help restore local lowland streams. This initiative was known as Living Streams, and it involved land-owners and community members meeting as a Resource Care Group (RCG) and acting collectively to address stream degradation through activities such as riparian planting and fencing (New Zealand Association of Resource Management, 2002). Attention then shifted to community action in larger catchments to improve environmental indicators, such as surface water quality and biodiversity, through provision of information about sustainable land management practices, stream enhancement strategies, and implementation of riparian zone management (Environment Canterbury, 2005). The work of the RCS was necessarily broad, responding to a wide range of environmental concerns. However, despite this range, the aim was consistent: achieving environmental

objectives through the facilitation of community partnerships and local dialogue, consultation and participative decision-making processes.

3.2. Agreeing on intervention purposes

In the above context, our research team and representatives from Environment Canterbury met to discuss a potential evaluation of resource care given the increasing need to justify investments in RCS activities in planning statements. Our team was told that the RCS was very popular with both Councillors and their communities, but there were concerns that the resource care processes in themselves were unlikely to address water quality issues and were poorly integrated with other Environment Canterbury activities – to the extent, in some cases, that they were perceived as undermining the effectiveness of regulatory enforcement. They were seen this way because they supported the self-organisation of local groups, regardless of whether those groups complied with or resisted regulation. Evaluations, if undertaken at all, were ad-hoc, inconsistent and did not acknowledge the complex social and cultural dynamics associated with CEM. The RCS was unable to offer a coherent explanation of how community engagement led to environmental outcomes, although individual staff noted mechanisms such as respectful communication (Dyer, Stringer, Dougill, Leventon, Mshimbi et al, 2014) and human and social capital (Morrison, Ockowski & Greig, 2011) as important enablers.

Evaluation was seen by our Environment Canterbury contacts as a means to methodically thread together stakeholder perspectives, tacit knowledge held by the RCS staff, and a rapid review of the CEM literature. The idea was to create an account of resource care practice that reflected locally-relevant social and cultural constraints and contingencies. The RCS staff saw promise in how evaluation could robustly theorise the way in which CEM could build community capacity for collective action, enhance Environment Canterbury activities and address low-land stream degradation. The project remit included work to enhance the RCS's ability to involve communities in environmental planning and action, and to encourage learning between the RCS and other sections within Environment Canterbury about how they could work together to more effectively to achieve environmental outcomes through community engagement.

3.3. Boundary critique

A number of authors in systems/OR (e.g., Ulrich, 1993; Midgley, Munlo & Brown, 1998; Midgley, 2000; Córdoba & Midgley, 2003; Boyd, Brown & Midgley, 2004; Foote et al, 2007; Midgley et al, 2018; Gregory, Atkins, Midgley & Hodgson, 2020) argue that deep explorations of the problem context are necessary prior to the selection or design of methods, as there may be hidden complexities and different perspectives on the nature of the issues to be addressed. A period of 'boundary critique' (exploring values, boundaries and stakeholder relationships relevant to the intervention) is required in order to evolve the project brief. Our team was fortunate to have secured financial support from the New Zealand Foundation for Research, Science and Technology (a central government research funder, now merged into the Ministry for Business, Innovation and Employment) to undertake three interventions sequentially over a six-year period, and our work with the RCS was the second of these, which meant that we were able to undertake a significant amount of part-time boundary critique over the two years in which our first project was in full swing.

Sixteen scoping interviews were conducted with key people in Environment Canterbury, drawn from the Resource Care, Compliance and Enforcement, Natural Resources Planning and Regional Engineering Sections. In addition, seventeen community members and stakeholders (including landowners, Māori, environmental non-governmental organisations, and central and local government agency representatives) were interviewed. These interviews took between 60 to 90 minutes, and were audio recorded for later transcription. Also, the research team participated in and observed six resource care meetings. Our understanding of RCS practice was supplemented with a rapid review of the literature relating to CEM mechanisms. The data were analysed using grounded theory procedures of open and axial coding (Strauss & Corbin, 1990).

The interviews and participant observations highlighted difficulties experienced by the RCS in articulating the rationale for working alongside communities and Māori to produce environmental outcomes, and in clearly communicating processes for engagement. These communication difficulties were recognised as a barrier to:

- Demonstrating the contribution of resource care activities to the environmental outcomes identified in planning documents;
- Determining the cost/benefit of funding invested in the RCS;
- Conveying to key stakeholders and other parts of Environment Canterbury what exactly is involved in resource care; and
- Identifying opportunities for Environment Canterbury to work more effectively with communities to achieve environmental outcomes, getting the best from both compliance and educative activities. Indeed, some interviewees characterised Environment Canterbury's interactions with the community as fragmented and incoherent.

Bellamy et al (2001, p.408) note that “natural resource management initiatives need to be evaluated as a system that links the objectives and instrumental rationale of the policy or program to actual performance on the ground”. Unpacking the programme logic, or making it explicit, provides the basis for evaluation because it describes the relationship between context, programme inputs, activities, outputs and intended outcomes (Cox, 2000; Fielden, Rusch, Masinda, Sands, Frankish et al, 2007).

Towards the end of the boundary critique, as we were finalizing the remit of the project in discussion with key stakeholders, the research team met with the RCS manager to discuss how a systems approach might strengthen the resource care logic. Key systems thinking skills are exploring part-whole systems, understanding multiple perspectives, examining interrelationships and considering alternative boundary distinctions (Cabrera, Colosi & Lobdell, 2008; Cabrera & Cabrera, 2015; Cabrera, Cabrera & Powers, 2015; Williams, 2015). An approach founded on use of these skills would better account for the non-linear, uncertain and possibly contested nature of CEM processes, unlike evaluation approaches (including some participatory frameworks) that involve less exploration and questioning, downplay the role of context, and assume a relatively simple link between programme activities and environmental outcomes (Bellamy et al, 2001; Hassenforder, Smajgl & Ward, 2015).

Embedding evaluation capability within the RCS was seen as critical (Taylor-Powell & Boyd, 2008). Rather than undertake an expert-driven evaluation exercise, it was agreed that the research team would partner with the RCS to develop and trial a participative evaluation methodology that could be used to foster critical self-reflection about ‘what works, what doesn’t and why’ (see Figure 1 for the intended logic of the approach). A key principle was that the methodology had to be *developmental* (Patton, 2006, 2010), in the sense that it had to provide feedback to the RCS in a manner that supported their ongoing learning and action in the context of complex socio-ecological systems.

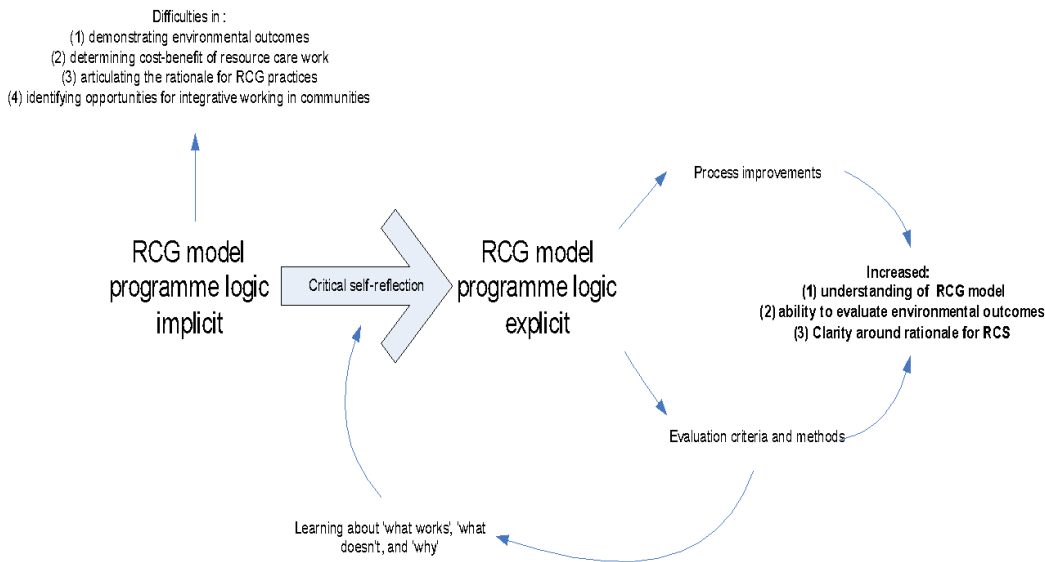


Figure 1: CEM evaluation methodology logic

The key idea in our project was that the RCS would be in a better position to communicate, and if necessary re-design, aspects of their programme that were uncertain, weak and/or contested if they could make the assumptions behind the resource care model explicit (see Hermans et al, 2012, for further thoughts on this kind of evaluation logic). In short, clarifying assumptions would lead to process improvements and help craft compelling causal narratives that showed how activities such as riparian planting lead to valued outcomes. Additionally, learning about ‘what works, what doesn’t and why’ would help in identifying potential evaluation criteria and methods (Rogers, 2008). Taken together, this process improvement, crafting causal narratives and identification of evaluation criteria would clarify the rationale for resource care and its contribution to environmental outcomes, and consequently increase external understanding (including within other parts of Environment Canterbury) of the work of the RCS, and how investment in it (or not) should be justified in planning. Moving from participative and strategic process improvement to the identification of evaluation criteria and measures is consistent with the participatory logic of systemic evaluation as expressed by Boyd et al (2007): only once stakeholders are reasonably confident that the programme being evaluated is doing the right things is it sensible to design metrics to assess performance.

4. Systemic CEM evaluation methodology

Further analysis of the boundary critique interviews and participant observations highlighted a number of difficulties in constructing a robust programme logic, including:

- How to deal with multiple perspectives (contestation) about resource care inputs, activities, outputs and intended outcomes, especially given tensions between different sections of Environment Canterbury about the role of the community in managing for environmental outcomes.
- How to express the relationships between these, even from a single perspective, given that resource care practices were considered by many people to be ad hoc.
- How to model aspects of the programme logic where the assumptions were uncertain (e.g., the extent of community capacity).
- How to meaningfully involve stakeholders and Māori, to ensure the social *and cultural* robustness of the programme logic.

Of course, these difficulties have also been documented and discussed by others (e.g., Morell, 2010; Patton, 2011). However, because we could not find an ‘off the shelf’ evaluation methodology appropriate to address them all, we drew on Midgley’s (2000) ‘creative design of methods’ to develop a tailored approach to formulating the programme logic that took the contingent and complex nature of CEM processes into account. According to Midgley (2000, p.226), the creative design of methods involves:

“...understanding the situation in which an agent wishes to intervene in terms of a series of interrelated questions, expressing the agent’s purposes for intervention. Each purpose might need to be addressed using a different method, or part of a method. The purposes are not necessarily determined as a complete set in advance, but may evolve as events unfold and understandings of the situation develop”.

The resulting intervention design used the methodology and methods from Soft Systems Methodology (Checkland, 1981; Checkland & Scholes, 1990; Checkland, 2001; Checkland & Poulter, 2006) imbued with some of the principles from Developmental Work Research (Engeström, 2000, 2005, 2015). Both methodologies have been identified as appropriate for evaluations where stakeholders are strongly involved, and they provide a set of ideas and tools that can empower participants to solve future problems (Checkland & Scholes, 1990; Gregory & Jackson, 1992a; Kajamaa, 2008; Foote, Scholes, Capper, Hill & Wilson, 2009). Individually, these approaches have been widely used to tackle real-world problems in a variety of domains (Checkland & Scholes, 1990; Checkland & Winter, 2006; Engeström 2005, 2015), but the synthesis described in this paper was designed specifically to address the problems faced by the RCS.

4.1. *Soft Systems Methodology*

Soft Systems Methodology (SSM) is “an organized way of tackling perceived problematical (social) situations ... it organizes thinking about such situations so that action to bring about improvements can be taken” (Checkland and Poulter, 2006, p.xv). SSM is structured around four core principles, which we believed would support the ability of the RCS to critically reflect on ‘what works, what doesn’t and why’:

- (1) *Identification of a problematic real-world situation requiring action for improvement.* Specifically, in the context of our project, this involved asking what issues needed to be addressed through evaluation. Unlike Hepi et al. (2007), who used a rich picture that did no more than visually describe the problematic situation (as Checkland, 1981, recommends), we followed an approach more akin to that taken by Paz-Ybarnegaray and Douthwaite (2017), who listed and agreed areas requiring change and desired outcomes associated with those areas;
- (2) *Creation of conceptual models:* these are “system[s] of activities that could be undertaken by human operators” (Wilson, 2001, p.12). We believed this would provide a disciplined approach to clarifying how the resource care logic operates, drawing on RCS staff descriptions of their work. Conceptual models provide a basis for identifying assumptions and issues, as well as reviewing goals and objectives (Margoluis, Stem, Salafsky & Brown, 2009);
- (3) *Comparison of the conceptual models with how people represent the real-world situation.* This would need to involve comparisons of conceptual models with what is known about how resource care works *in practice*, including different perspectives on the cultural and political contexts in which the RCS operates (also see Rodríguez-Campos, 2012); and
- (4) *Structured dialogue about desirable and feasible changes.* In our project, we believed that this would enable the identification of potential process improvements. It would also help identify the evaluation criteria and methods needed to judge whether resource care practices are working. We were cognizant of the varying capacities of stakeholders and Māori to engage in dialogue, and the need to ensure that cross-cultural dialogue in particular would occur in a safe and respectful way (Foote et al, 2007; Hepi et al, 2007).

4.2. Developmental Work Research

SSM has been critiqued for its overreliance on participation to address "conflicts of real interest" (Jackson, 2000, p. 268) (also see Mingers, 1980, 1984; Jackson, 1982; Munro, 1999). Our boundary critique revealed various stakeholder tensions that pointed towards deep-seated conflicts between mana whenua (the ‘people of the land’, or local Māori), landowners and Environment Canterbury. We were concerned that a CEM evaluation based on SSM alone may lead to Māori and the community being marginalised. Therefore, the SSM principles were supplemented with Developmental Work Research (DWR): an approach that addresses practice-based theorising, knowing and change (Engeström, 2005, 2015). The DWR principles (such as intellectual reflection, emotional confrontation and searching for conflicts and contradictions that people can learn from) are critical-systemic in nature, as they assist people in re-evaluating the perspectives they bring to discussions, and they open up the possibility of generating novel framings, strategies and actions. That is, they foster cycles of expansive learning (Engeström, 2001). These DWR principles alert us to socio-cognitive aspects of intervention (Virkkunen, 2013). Some other forms of evaluation only advocate participation because it leads to the greater uptake of findings, and this makes the nature of that participation rather instrumental and passive (Smits & Champagne, 2008). In contrast, we drew on DWR to emphasise and foster the *active* involvement of community stakeholders and Māori in rethinking and improving RCS organisational practices (cf: Laursen & Salter, 2006). As ‘critical friends’, community

stakeholders and Māori challenged the perspectives of RCS staff and stimulated honest reflections on how resource care activities worked *in practice*.

SSM and DWR both utilise qualitative models as boundary objects. However, to enhance intellectual reflection, we opted for SSM's conceptual modelling rather than Engeström's (2005) activity system diagramming as, in our experience, the former is easier to introduce to participants, and people grasp it more quickly.

4.3. *The systemic CEM evaluation methodology in use with the RCS*

The way in which SSM and DWR principles are operationalised in the approach we designed is set out in Figure 2. Step 1 identifies the focus of the evaluation (that is, the situation requiring action for improvement). Steps 2-4 express (in systems terms) how the resource care activities are perceived as leading to selected outputs or outcomes. Making the logic of resource care discussable (and therefore subject to debate), CATWOE and conceptual models provide the basis for formulating causal narratives about CEM effectiveness. Steps 3-4 may generate several causal narratives with each expressing a particular perspective about the relationship between community participation and environmental outcomes. Steps 5-6 test the *usefulness* of the causal narratives in terms of the extent to which they support the identification of process improvements, meaningful evaluation criteria and methods to inform ongoing work to refine the causal narratives. Concern to support the meaningful participation of stakeholders and Māori runs through steps 1-8.

Given that causal narratives are a substantial focus in the above paragraph, and (as already discussed) the complexities of context make it difficult to establish a simple, cause-and-effect relationship between CEM and any given environmental outcome, it is worth saying something more about the philosophy of causality that we base our methodology upon. As discussed by Hume (1739, 1748), when we say that there is a causal relationship between two phenomena, it is due to an impression, or an experience, that there is an association between them that cannot be explained any other way. If the causality is of a general type, rather than referring to a single instance (i.e., 'riparian planting filters pollutants', as opposed to 'our riparian strip seems to have improved the situation with pollution this year'), then the impression or experience comes from *repeated* observations of the association.

The words 'impression' and 'experience' carry with them an important assumption: that there is an observer (or participant) being impressed or experiencing, so, in principle, subjectivity cannot be removed from any statement about causality. As Popper (1972) explains, regardless of how much evidence there is of a causality, there always remains a possibility (however remote) that it has been mistakenly identified because of limitations inherent in the methods of observing an association (perhaps there were not enough observations to catch an infrequent exception, or an important additional variable was excluded from the observations): at the end of the day, the existence of a causality is just a proposition that is consensually accepted by a community of interested observers, based on a body of evidence. This is the case even if, in practice, we start to use 'mental short-hand' and think of that causality as independent of any observer.

However, returning to Hume's argument that there is always an impression or experience involved in the identification of any given causality, if nothing valid or legitimate could be said about it in the absence of personal experience, then this would be impossibly limiting. For instance, to return to the example of riparian planting, it is well known in environmental

management circles that it helps to “protect river banks, control erosion, capture and recycle mineral nutrients, increase biodiversity and filter pollutants” (SEPA, 2009, p.15), yet how many people will insist on personally undertaking repeated scientific studies before accepting the causality implied in this statement? Clearly, trusted communications from others can be a basis for assuming causality too, so ideas about causality can become inter-subjectively shared. This is why causal *narratives* are so important. Narratives about causality do not have to portray a simplistic, linear relationship between two phenomena, but can also embrace systemic or circular causalities (e.g., as discussed by Weiner, 1948; Forrester, 1971; and Bateson, 1979) and contextual factors that make a difference (e.g., as examined by Flood & Carson, 1993; Matthews, 2004; and Shen & Midgley, 2007).

Of course, for a communication about causality to be trusted, the people doing the communicating have to have their perspective accepted as legitimate, and one function of a CEM evaluation methodology is to provide a *robust process* to derive statements of causality from dialogue, and hence provide legitimacy to conclusions about the value (or otherwise) of CEM. Different causal narratives may actually be important to different stakeholders in that dialogue, depending on their purposes and values, which is why this view of causality is a good fit with the SSM elements of our methodology, because SSM encourages mutual appreciation of different perspectives (Checkland & Poulter, 2006). Indeed, the idea that elements of subjectivity and inter-subjectivity are always implicated in causalities (even if we often talk about them as purely objective) is a good fit with the philosophy underpinning problem structuring methods more generally, given that they usually assume there are multiple individual and social realities (plural) that are all meaningful to the people acting on them, rather than one viewpoint that is true and others that are false (Jackson, 2006). Hence, the emphasis in problem structuring is on building better mutual understanding of what is meaningful to different people, as opposed to discriminating between truth and falsehood as a basis for agreed courses of action.

Our systemic CEM evaluation methodology aims to enable participants to reach accommodations on programme activities, outcomes, evaluation criteria, methods and process improvements. In doing this, our approach helps craft one or more causal narratives (typically several, from different perspectives), which link the ways in which community, participation and environmental outcomes are interrelated. Figure 2 indicates a step-by-step process, but in practice, in our project, there was considerable overlap and iteration between steps, as is usual with soft (dialogical) systems approaches (Checkland & Scholes, 1990) and problem structuring methods more generally (Rosenhead & Mingers, 2001). Figure 2 includes some of the major feedback loops between steps. While Figure 2 resembles other participatory evaluation methodologies (e.g., Paz-Ybarnegaray & Douthwaite, 2017), the synthesis of methodological principles and methods (as noted above) was designed to be specific to the challenges facing the RCS and was intended to address recognised evaluation bottlenecks (a point we return to in the discussion section).

The methodology was trialled in a series of five, half-day workshops attended by twelve resource care staff, a Māori representative and six stakeholders, including community groups and central and local government agencies. The first two half day workshops explored the social, political, cultural and environmental contexts of resource care practice, and defined the focus of the self-evaluation. The remaining three half day workshops aimed to demonstrate a systemic

evaluation approach to CEM; develop evaluation criteria and tools to support ongoing learning about resource care activities; and explore any potential improvements to resource care practices. The workshops considered different aspects of RCS practice, and were held 'off site' to provide resource care staff the time and space for reflection and critical thinking, away from day-to-day work distractions. They were designed to be self-documenting through the use of post-it notes and flip-charts, and had an operational focus where action planning was an explicit aspect of critical self-reflection (this was not just learning for its own sake).

4.4. A worked example

Below, we explain the systemic CEM evaluation steps, represented in Figure 2, with an example from workshop discussions regarding how the RCS could effectively support the development of a community action plan to manage environmental issues. Of course, the development of a community action plan is merely a first step in creating an overall causal narrative that links community participation to environmental outcomes, and so was not the sole focus of our evaluation (causal narratives for other valued outputs and outcomes were modelled over the five workshops, but are not reported here). Nevertheless, it provides a simple, concrete example to illustrate how we trialled the methodology, including how the SSM and DWR principles and methods were operationalised.

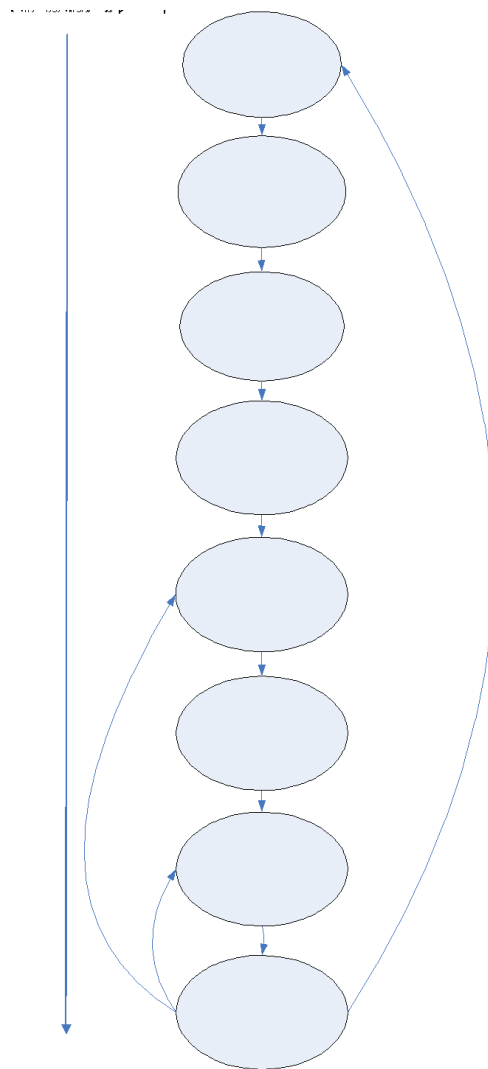


Figure 2: Systemic CEM evaluation methodology

(1) Select the key output or outcome that will be the focus of the self-evaluation.

The first workshop was convened, and participants included the RCS staff; community stakeholders, such as Forest and Bird (an environmental non-governmental organisation); and representatives from central and local government agencies (such as the Department of Conservation and Christchurch City Council). Prior to the workshop, we shared our boundary critique and asked participants to introduce themselves by speaking to a theme in the boundary critique analysis, which resonated with their experience of resource care practice. In sharing our boundary critique, we reflected different perspectives on resource care practice back to the RCS staff, and emphasised the role of stakeholders and Māori as critical friends (following the DWR principle of intellectual reflection).

The participants were asked to brainstorm positive/desirable outputs and outcomes associated with effective resource care practice (although we note that whether something was classified as an ‘output’ or an ‘outcome’ sometimes varied across stakeholder perspectives). This focus on positive/desirable outputs and outcomes is consistent with the strengths-based philosophy adopted by the RCS (following Cooperrider & Srivasta, 1987). Stakeholders and Māori kept the generation of

ideas ‘grounded’ in practical experience, with an eye on achievability, and they made suggestions that did not originally occur to the RCS staff. Brainstorming produced a number of ideas ranging from the particular to the general, and a nominal card-storming technique (Taket & White, 2000) was used to group and amalgamate ‘like ideas’ in order to narrow down the evaluation focus.

There was widespread agreement about the centrality of a community action plan to effective resource care practice, so participants decided to focus one part of the systemic evaluation around *the development of a community action plan to manage environmental issues*.

(2) Express the key output or outcome as a transformation.

A second workshop expressed the development of a community action as a transformation. That is, a change in “some defined input into some defined output” (Checkland, 2001, p.74). A transformation can reflect ‘primary tasks’ (e.g., community need for environmental education ☐ community need for environmental education met) or be ‘issue based’ (e.g., resource care workload is unreasonable ☐ resource care workload is manageable). The transformation chosen by the participants can be found in Table 1.

Table 1: Transformation chosen by the participants

Key Output:	Development of a community action plan to manage environmental issues.
Transformation:	Few people understand the environmental ‘big picture’ ☐ more people understand the environmental ‘big picture’.

There are many ways that the above outcome could have been worded as a transformation (e.g., need for community action plan ☐ need for community action plan met), but participants unanimously favoured the above because of the importance of developing a collective motivation for environmental sustainability.

(3) Develop a shared understanding of the transformation using the CATWOE mnemonic.

The second workshop then applied the CATWOE mnemonic (CATWOE stands for Customers, Actors, Transformation, Worldview, Owners and Environmental Constraints) to provide a methodologically coherent way of dealing with multiple perspectives held by different actors. A CATWOE elucidates the complexity of factors involved in a desired transformation (Checkland, 1981), and the use of CATWOEs can help to build mutual understanding between stakeholders by structuring dialogue around the above-mentioned concepts, thus limiting the amount that stakeholders talk past one another. Worldviews were surfaced by asking participants what assumptions made the transformation meaningful. In addition, CATWOE was a useful tool to aid intellectual reflection (one of the DWR principles) by creating an opportunity for participants to step back from the frustrations of resource care practice and recognise the considerable challenges involved in navigating the interests, needs and capacities of multiple actors.

In contrast to Checkland (1981), who advocates building multiple CATWOEs in order to prevent the premature narrowing of perspectives and avoid the assumption that there can be only one valid model of practice, the participants

worked collaboratively to create a single CATWOE, discussing at length what elements (such as ‘owners’) meant in relation to resource care practice. The CATWOE they agreed was:

Customers: Fish and Game, Māori, community members, conservationists, recreationalists, farmers, individual landowners, environment;

Actors: resource care staff, community leaders, other Environment Canterbury staff (e.g. engineers, scientists), government agencies, interest groups, business, Māori, individual landowners, community members;

Transformation: Few people understanding the environmental ‘big picture’ → more people understanding the environmental ‘big picture’;

World-view: The role of Environment Canterbury is to support the community, but ‘on tap, not on top’;

Owners: Powerful (articulate/‘loud’) actors with a negative view of the community action plan, government agencies, council elected representatives; and

Environmental constraints: Funding, time, lack of information or understanding, willingness of participants to resolve issues, resources (e.g. computers, resource care coordinators).

(4) Create a conceptual model of the logical activities needed to successfully carry out the transformation.

Similar to Margoluis et al (2009), who examined how conceptual models can support planning and evaluation in conservation, we used conceptual models in the third workshop to describe the systemic relationships between activities that could lead to particular outcomes or key outputs. In several cases the rationale for activities set out in the conceptual models drew on mechanisms noted in the literature. For example, in Figure 3, ‘Activity 1’ mirrors the finding that interventions based on existing community structures are more likely to be effective than ones requiring the complete reinvention of structures (Conway, Tunks, Henwood & Casswell, 2000). Following Checkland (1981), all the activities that participants saw as *logically necessary* to create a community action plan were brainstormed, expressed with verbs up-front, and placed in relationship to one another (Figure 3).

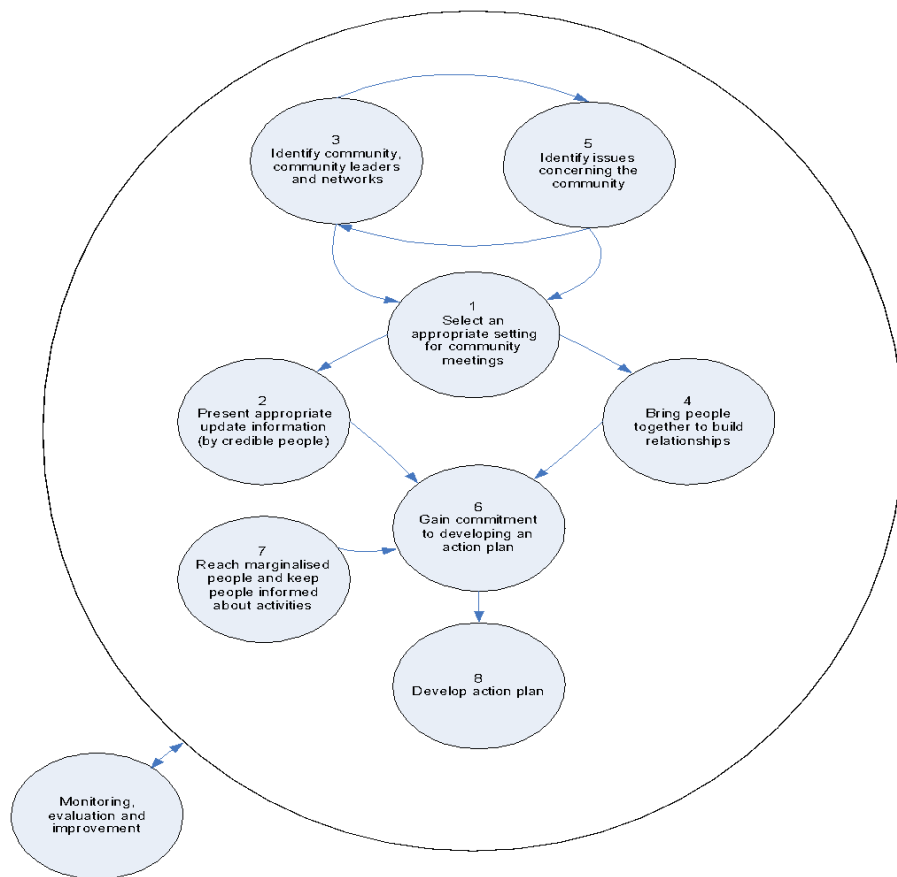


Figure 3: Conceptual model

(5) Compare the model with what is known about RCS activities.

The fourth workshop saw Figure 3 scrutinised by the participants, and examples of each activity in current resource care practices were identified. Although the activities listed in Figure 3 could possibly be seen as principles rather activities, participants were nevertheless able to articulate how each of them might be operationalised in practice (e.g., selecting an appropriate setting for a community meeting included finding a space that would be perceived as neutral and could comfortably accommodate attendees), so we believe that calling them activities is justified. This consideration of how the activities would be operationalised gave the participants confidence that the thinking around the conceptual model was robust and was building on existing resources and activities, rather than inventing them from scratch. This was important because there was a worry that, if the required actions were too resource-intensive, implementation would stall. For each activity in the conceptual model, the following questions were asked:

- Is the activity being done?
- If not, *should* the activity be done?
- If it is being done, how well is it being done?
- How do we know how well it is being done?
- Who is doing it (the RCS, other parts of Environment Canterbury, central or local government, Māori and/or community stakeholders)?

- What are the possible improvements to the activity?

This process of systematic questioning enabled stakeholders and Māori to challenge taken-for-granted or dominant assumptions. The RCS staff members were therefore unable to gloss over any difficult and unresolved issues. In this way, the DWR principle of emotional confrontation enhanced the process of comparing the model with resource care practice and led to insights about the barriers that limited the effectiveness of resource care activities.

(6) Brainstorm potential improvements, evaluation criteria and evaluation methods for each activity.

In the fourth and fifth workshops, interactive discussions between the RCS and stakeholders highlighted a number of potential improvements, evaluation criteria and methods (see Table 2 for an example). Key learnings for the RCS staff centred on the need to clarify resource care purposes, plus the importance of Māori engagement and how to undertake this effectively and meaningfully. We viewed this as evidence of expansive learning (one of the DWR principles), as the ideas that evolved in the workshops involved thinking ‘outside the box’ of previous comfortable understandings. These learnings are covered more fully in the next section.

Table 2: Activity 2 - Present appropriate and up-to-date information (by credible people)

Activity 2	Possible evaluation criteria	Measurement method	Audience (those interested in the evaluation result)
Present appropriate and up-to-date information (by credible people) That is, at each community meeting, attendees are provided with information about catchment history, issues and opportunities by trusted sources	<ul style="list-style-type: none"> • Scene setting information is provided • Experts are acceptable to the community • Topics are salient to community • Good balance between technical and traditional ecological knowledge • Presentation style appropriate • Answers to questions seen as credible 	<ul style="list-style-type: none"> • Observation • Body language • Number of hostile questions • Follow up questions for presenters • Requests for further information • Number of misinterpretations • People’s reaction to information, including defensive questions and whether presenters talks are referred to in later meetings 	<ul style="list-style-type: none"> • Community • Elected representatives • RCS • Stakeholders

(7) Prioritise potential improvements, evaluation criteria and evaluation methods.

Given the number of potential evaluation criteria and methods brainstormed for each activity, the three most important activities for the ‘development of a community action plan’ were prioritised in the final workshop:

- Activity 2: Present appropriate and up to date information (by credible people);
- Activity 5: Identify issues that concern the community; and
- Activity 7: Gain commitment to developing an action plan.

Three of the most promising evaluation criteria within each activity were selected. An example of prioritised evaluation criteria is highlighted in Table 3. The robustness of selected evaluation criteria and methods relating to prioritised activities was assessed by considering strengths and weaknesses. Participants were then asked to vote for the evaluation criteria they

felt best captured the essence of the activity. The strengths/weaknesses assessment and prioritisation of activities and evaluation criteria enabled the participants to determine the most appropriate way of evaluating resource care practices for their contribution to the ‘development of a community action plan’.

In the course of developing evaluation criteria, several measurement methods were designed. The majority of these were based on existing resource care activities, including:

- Compiling meeting attendance registers;
- Recording participant address lists;
- Recording numbers present at meetings;
- Documenting/reporting invitations to other fora;
- Conducting and documenting stream walks; and
- Monitoring of action plans.

(8) Trial prioritised potential improvements, evaluation criteria and evaluation methods.

At the completion of the workshops, the research team met with the RCS manager to discuss trialling prioritised evaluation criteria and methods and, more importantly (in terms of the aims of the research project), what was required to embed the evaluation approach. Implementation issues were also discussed, including being careful not to overload programme leaders with additional work. The manager reported on the RCS’s satisfaction with the evaluative criteria, noting that evaluation was now designated a core element of resource care practice and had begun to be incorporated into job performance measures and key milestones.

Table 3: Prioritised activity and evaluation criteria

Activity 5	Prioritised evaluation criteria	Measurement method	Target
Identify issues that concern the community That is, to identify, discuss and document the environmental, social, cultural, economic and health issues and opportunities that characterise the catchment	<p><i>Stakeholders most likely to be involved have been identified via stakeholder analysis.</i></p> <p><u>Strengths:</u> Systematically identifies those who should versus could be involved.</p> <p><u>Weaknesses:</u> Identifying key contacts can be difficult</p>	<p><i>Evidence that a stakeholder analysis has been undertaken and documented</i></p>	<p><i>All relevant stakeholders identified and spoken to about resource care related issues concerning them</i></p> <p><u>Strengths:</u> Stakeholders included, increasing understanding about issues</p> <p><u>Weaknesses:</u> Time consuming and may involve trade offs</p>
	<p><i>Mana whenua [people with authority over tribal land] directly asked (preferably face to face) about resource care engagement</i></p>	<p><i>Evidence that meetings with mana whenua or iwi [tribal] representatives to determine who RCS</i></p>	<p><i>Mana whenua have been approached and consulted with face to face</i></p>

	<p><u>Strengths:</u> Explicitly acknowledges the Treaty of Waitangi and fosters regional council / mana whenua relationship</p> <p><u>Weaknesses:</u> Non-Māori stakeholders may not understand the regional councils' Treaty of Waitangi obligations</p>	<p><i>staff should engage with</i></p>	<p><u>Strengths:</u> Increased understanding</p> <p><u>Weaknesses:</u> Mana whenua may be over-consulted and issues may not be relevant to them</p>
	<p><i>Presenters spanning a range of views, perspectives and issues identified and approached to present at community meetings</i></p> <p><u>Strengths:</u> Topics selected with the community have relevance</p> <p><u>Weaknesses:</u> Selecting right presenter can be challenging, and political/legal issues prevent presenters from sharing information</p>	<p><i>The extent to which the range of presenters is assessed against the range of stakeholder interests (identified in the stakeholder analysis) and catchment issues</i></p>	<p><i>All relevant views and issues are represented by presenters at meetings</i></p> <p><u>Strengths:</u> All relevant views aired, and there is ownership of issues</p> <p><u>Weaknesses:</u> Time consuming, potential for conflicting views</p>

5. Intervention outcomes

Workshop participants were invited to complete a survey (based on Midgley et al, 2013) designed to assess the effectiveness of the systemic CEM evaluation methodology discussed in this paper. Survey findings included how the workshops clarified “the need for Resource Care to monitor and evaluate what, why and how we do it”; enabled RCS staff to “learn a lot about Maori perspectives ... [and how] to incorporate [these] into our processes for the future”; and were “useful to put some theory behind our everyday practice and reinforce key steps” (all quotations from the survey). According to the workshop participants, the systemic CEM methodology generated valuable learning about the tensions inherent in resource care practice and discussion about how they might be resolved.

Below we examine two key conflicts, which were particular foci of the workshop discussions because our participants saw them as significant roadblocks to the kind of community engagement that could lead to environmental outcomes. As such, how these conflicts were going to be managed by the RCS was a key aspect of the causal narratives that situated resource care practices within complex (and at times contested) environmental, social and cultural contexts. The participants identified that failure to successfully manage these conflicts could decouple the community engagement from the anticipated environmental outcomes. Below, we have used a simplified version of the diagramming conventions of boundary critique (Midgley & Pinzón, 2011) to present the conflicts visually (Figures 4 and 5). Discussion of the two conflicts with RCS staff helped them identify a couple of significant improvements that could be made to the resource care model: working more closely with other sections within Environment Canterbury to coordinate activities within communities, and engaging more effectively with Māori.

5.1. What should be the purpose of the work of the RCS?

The first conflict was between the RCS and other parts of Environment Canterbury, and it was about the purpose of resource care. This conflict, or entrenched disagreement, is depicted in Figure 4, where tension arises from the clash of two values. The first value (promoted by the regulatory sections of Environment Canterbury) focuses on the importance of the activities that support ‘stream care’, such as riparian planting. The second value (dominant within the RCS) focuses on relationship building between resource care staff and community stakeholders, as well as within affected communities, and expands the scope of resource care activities to include non-environmental outcomes identified by the community as important (e.g., road safety across river bridges, rather than just water quality issues). Water quality is, however, a common concern, and is a focus for tension because of the different frames (above) that the RCS and other parts of Environment Canterbury use.

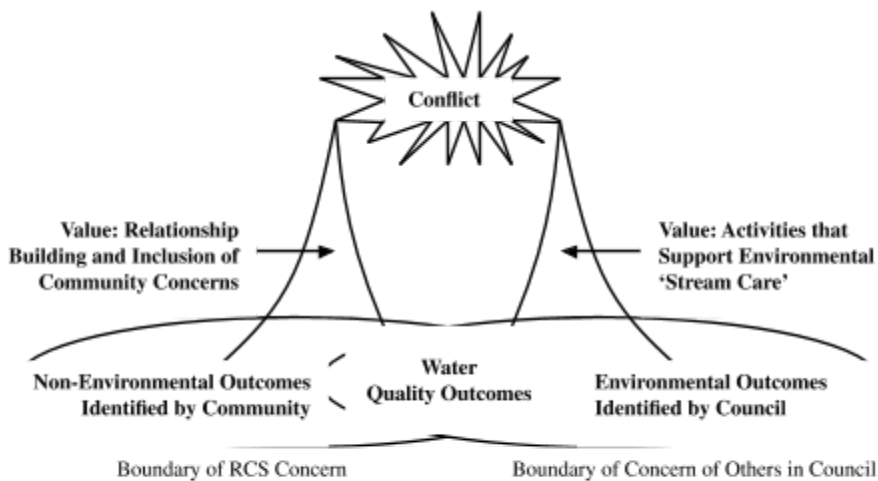


Figure 4: Tension over purpose

Conflicts are often stabilised rather than resolved, and Midgley’s (2000) view is that this is commonly achieved by either the ritualised marginalisation of people and/or issues, or mutual stigmatisation and strategic battles that never actually lead to a definitive outcome. The result in either case is likely to be a dismissive attitude towards alternative perspectives, leading to mutual distrust which makes constructive dialogue difficult (Midgley, 2016). Because the RCS had the support of councillors, they were not exactly marginalised, but seemed to be in a dynamic of mutual stigmatisation with their colleagues in other sections of the organisation. We found evidence of this dynamic with ‘typifications’ (Loseke, 1999), or stereotyped descriptions, of the RCS staff as the “tea and biscuits brigade”. In contrast, enforcement sections were referred to by the RCS as “the Police”. Despite this tension between the ‘community development’ and ‘enforcement’ frames, the need for the RCS to work closely with other Environment Canterbury sections remained, especially as the RCS regularly drew on wider Environment Canterbury resources (e.g., scientific data and expertise).

The workshops helped to focus the RCS staff members’ thinking on their relationship with their parent organisation, and action planning for an Environment Canterbury-wide workshop on integrated catchment management was pursued. However, because the research team was unable to facilitate the attendance of non-RCS staff before the end of the project,

the opportunity to stimulate wider institutional change with our involvement was not realised. Nevertheless, follow up communication with the RCS pointed to significant individual and group learning within it about what it could do on its own to build bridges with other parts of the organisation. This included giving a presentation to Environment Canterbury elected representatives and staff about resource care principles and processes, and especially how CEM helps achieve wider organisational outcomes. This presentation, plus other meetings with people in different roles in the organisation, took place as planned.

The original logic of our intervention (and consequently our systemic CEM evaluation methodology) was that more robust evidence about the value of resource care would influence the enforcement sections in Environment Canterbury. This was certainly the belief of management, who asked us to focus on the evaluation of the RCS. However, communications with the enforcement sections turned out to be less straightforward than anticipated, and we will pick up this theme and explain the reasons why in our discussion (Section 7).

5.2. Involvement of Māori

The second conflict, or tension, that became a significant focus for RCS learning arose from competing understandings of Māori involvement in resource care processes: some people saw Māori as a Treaty of Waitangi partner, while others viewed Māori as a stakeholder group (Figure 5). The Treaty of Waitangi was signed by the British Crown and Māori in 1840, and it established the right of the Crown to govern; guaranteed Māori control with respect to economic and other resources; and sought to ensure that Māori have the same rights as British citizens (Durie, 2001; Harmsworth et al, 2016). The Resource Management Act (1991) sets out Treaty obligations and requires “environmental managers and planners to take account of Māori values, culture and traditions and encourage Māori participation in decision making” (Memon & Perkins, 2000, p.21). However, in resource management, ‘taking account’ of Māori is often reduced to treating them as passive respondents rather than genuine partners (Durie, 1998). This is consistent with Māori being viewed as one amongst many stakeholder groups, with no more right to active participation than others.

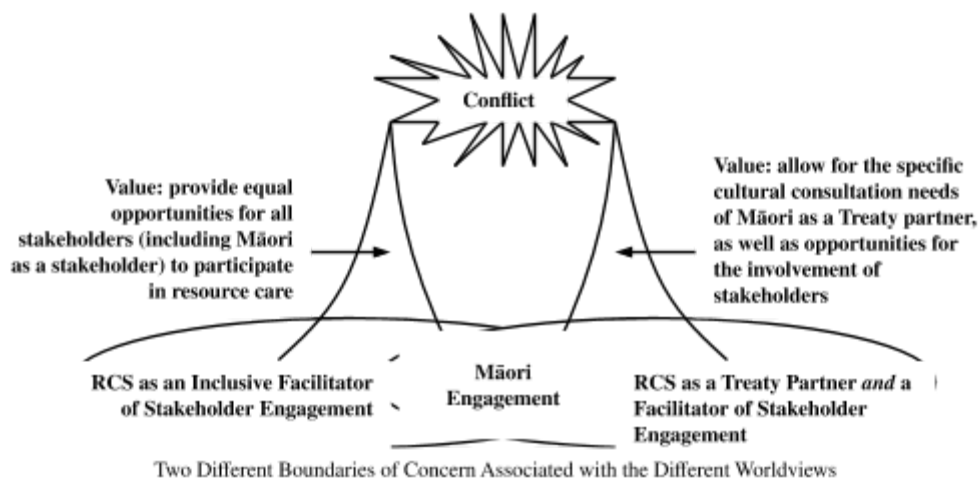


Figure 5: Tension over the involvement of Māori

As resource care activities are non-statutory, there is no imperative on the RCS to recognise the rights of Māori, except in the capacity of land owner. Matunga (2000, p.37) notes that the “reinclusion of the Treaty into contemporary environmental planning is a major challenge”. A government report on Māori and the Resource Management Act (1991) notes that:

“Successful council-Māori relationships cannot be based solely on strict adherence to legislative requirements. They require councils to appreciate both the role of tangata whenua [‘people of the land’, which is how Māori refer to local indigenous people] in their community, and the value their extensive local knowledge can add to achieving positive community outcomes” (Te Puni Kōkiri, 2006, p.7, our addition in square brackets)

However, some RCS staff feared that explicitly acknowledging the Treaty, and specifically the Treaty partner status of Māori, would compromise their interactions with non-Māori stakeholders, such as farmers, irrigators, kayakers and birdwatchers. Their concern was that this could potentially upset people whose understanding of and commitment to the Treaty was limited. In response to these concerns, the RCS had adopted a ‘one size fits all’ approach, which subsequently resulted in low levels of Māori participation: because Māori expected to be consulted as a Treaty partner with the right to determine *how* they would be involved, they were less inclined to participate when they were regarded as ‘just another stakeholder’. Workshop discussion (with Māori involved) focused attention on how to improve Māori participation. Initiatives included *kanohi ki te kanohi* (face to face) meetings at an agreed time and venue; holding resource care meetings and events at *wharehenui* (traditional meeting houses); and raising awareness amongst non-Māori that Māori involvement is not merely an issue of meeting statutory obligations, but is important because non-involvement would result in the RCS ignoring significant local knowledge about resource care (Hepi & Foote, 2013).

6. Discussion

While community engagement is increasingly seen as a key component of natural resource management practice (Kirk, 2017; Robins, Burt, Bracken, Boardman & Thompson, 2017), the use of participative methods is not without challenge (Cradock-Henry, Greenhalgh, Brown & Sinner, 2017; Konsti-Laakso & Rantala, 2018). There is ongoing scholarly debate about the effectiveness of collaborative and participative processes (e.g., Cooke & Kothari, 2001; Hickey & Mohan, 2004; Hassenforder et al, 2015), and how challenges such as diversity (e.g., Hermans et al, 2012), inclusion (Baur et al, 2012) and power relations (Parkinson, 2009) can be managed. Below, we reflect on four possible challenges to the effectiveness of our systemic CEM methodology and consider the extent to which the use of boundary critique and the creative design of methods enabled us to be responsive to the social, cultural and political issues facing the RCS.

6.1. Was the burden of participation too great?

The first possible challenge that we need to take seriously is that participatory evaluations tend to be resource intensive and make significant demands on stakeholders, including those who may lack the resources and/or skills to meaningfully participate in workshop discussions (Parkinson, 2009). Such evaluations are typically commissioned by external agencies (e.g., funding bodies), may not necessarily be seen as salient or legitimate by community organisations, and can place a burden on communities (Parkinson, 2009). Not surprisingly, maintaining stakeholder engagement throughout the life of an evaluation project can be problematic, and this in turn may impact on the legitimacy and credibility of the evaluation findings (Lennie, 2005). The criticism that we imposed a resource-intensive participatory process on the RCS could be levelled at our systemic CEM evaluation methodology, given the need to involve a number of internal and external stakeholders in a time-consuming (albeit insightful) process of qualitative modelling and structured dialogue.

Our first point in reply to this is that the RCS specifically asked for a participative evaluation: this was not imposed by the requirements of an external funder. While we *were* in receipt of external funding for research on participatory methods, this came about because we had written a funding proposal explaining that the RCS and two other regional council organisations had asked for support in developing new participatory processes. In other words, the desire of the RCS for a participatory approach was there before either our research was designed or funding was sought. Of course, being driven primarily by client and stakeholder agendas, rather than methodological preferences, is normal in much OR practice.

Our second point is that, utilising boundary critique and the creative design of methods, we were able to design an approach that took account of the different needs, interests and values of participating stakeholders. This created the conditions in which value co-creation could result, thereby overcoming a well-documented bottleneck to participation: focusing on issues and outcomes that are only significant to a minority of stakeholders (Vargo & Lusch, 2008). A good example of overcoming this problem was our involvement of Māori. Because the Resource Management Act (1991) mandates the engagement of Māori, they risk being over-consulted on issues that may or may not be their priorities. In our case, because we made it clear that Māori would be able to introduce their own concerns into the evaluation design without any pre-conditions, the Māori representatives saw an opportunity to influence resource care practice by participating in the workshops as ‘critical friends’.

6.2. Did the wider organisation, beyond the RCS, have the capacity to use the evaluation findings?

A second challenge that we need to account for relates to the capacity of an organisation to utilise evaluation findings. A key concern that prompted our intervention was the difficulty that the RCS faced in articulating the rationale for its work to other parts of Environment Canterbury, which inhibited its staff in finding ways to work more effectively with those other parts to achieve environmental outcomes. Given the tensions that existed between the RCS and these other parts of Environment Canterbury (Figure 4), and the likelihood that this would hinder dialogue, workshop participation was limited to RCS staff and external stakeholders only. By creating a safe space where RCS staff were challenged to articulate a robust theory of change, and by building evaluative capacity within the RCS, our intervention attempted to address the marginalisation dynamics that existed within Environment Canterbury. Our approach was informed by the systemic insight that empowerment in a safe space is a necessary counterweight to processes of marginalization if fair dialogue is to take place (e.g. Ulrich, 1994; Midgley, 1997b; Gregory & Romm, 2001; Boyd et al, 2004). Likewise, Baur et al. (2012) talk about creating the conditions for fair dialogue by including marginalised groups, while encouraging mutual learning and building trust along the way. Our hope was that this approach would better prepare the RCS to use the evaluation findings to engage with others within Environment Canterbury (including management). However, we could be criticised for failing to build capacity in the wider organisation so that people there would be responsive to the findings.

Although the systemic CEM evaluation methodology helped articulate a robust programme logic that was shared with others in Environment Canterbury, communications with the enforcement sections of the organisation were not as fruitful as hoped for. This prompted the research team to undertake a further boundary critique, going back over our interview data from the start of the project to look at how different institutional logics (Thornton et al, 2012), or institutionalised framings, shaped the ways in which the concepts of ‘community’ and ‘participation’ were understood in different parts of that organisation – and, as a result, the extent to which the programme logic might have been seen as credible by others. Members of the RCS shared a ‘pluralistic logic’ of community participation, which highlights the need to both include and manage multiple stakeholder interests, and it privileges community knowledge over technical scientific expertise. However, we identified at least three more ‘participatory logics’:

1. A ‘bureaucratic logic’, which emphasises rational-legal administration, efficiency and a ‘one size fits all’ approach. This emphasises the value of technical scientific expertise, economic considerations and legislative requirements, and was drawn on by the Compliance and Enforcement, Natural Resources Planning and Regional Engineering Sections of Environment Canterbury.
2. A ‘representative logic’, which prioritises universal enfranchisement, political equality and majority rule, where citizen views and interests are represented through elected councillors. This understanding was embraced by Environment Canterbury’s elected representatives, but was also welcomed by the RCS (in addition to their pluralistic logic), as they enjoyed support from these elected representatives, which (to an extent) protected them from negative attention by others in the organisation who were sceptical of the rationale for CEM.
3. A ‘Treaty-based logic’, which reflects the provisions and principles enshrined in the Treaty of Waitangi, where Māori and the Government are supposed to work in partnership to achieve mutually acceptable goals. This logic

interacts with the bureaucratic and pluralistic ones, given that the Resource Management and Local Government Acts set out obligations for involving Māori in decision making, and Māori hold traditional ecological knowledge which is viewed as an important input into resource care processes.

It appears that these different participatory logics significantly impacted on the ability of parts of Environment Canterbury to understand the RCS's causal narrative linking community participation with environmental outcomes, which explains why the discussions it initiated were not straightforward and did not result in any significant change. Earlier, in revealing our theoretical assumptions about narratives of causality, we discussed the importance of trusted communications to the legitimacy of a claim that a causality exists. If such a claim is expressed in a logic that is alien to those hearing it, it undermines legitimacy. As distinct groupings of rules, beliefs, values and practices, these participatory logics (like all the institutional logics discussed by Thornton et al, 2012) were deeply resistant to change because they had been institutionalised in the business-as-usual functioning of the relevant parts of the organisation. They represented a significant challenge to convincing stakeholders who did not participate in the workshops of the value of resource care. This highlights the need, when resource care is just one function within a larger organisation, to broaden evaluation capacity-building and enable fuller *organisational learning* (Cousins, Goh, Elliot, Aubry & Gilbert, 2014).

On this basis, we accept the criticism that we failed to build wider capacity in Environment Canterbury to use the evaluation findings. In our defence, we should note that this omission was not exactly an oversight: we identified a resource constraint early in our project (our available time and funding was limited), and we discussed priorities with both the RCS and the Chief Executive of Environment Canterbury. Agreement was secured to focus primarily on evaluation to support the RCS, with wider engagement with other sections towards the end. This seemed reasonable in light of the strong support of the elected representatives for the work of the RCS. However, in retrospect, it was arguably a misjudgement – although we should add that the RCS staff certainly felt empowered to undertake engagements themselves, even if they were not as fruitful as they might have wished.

This connection between institutional logics and the utilisation of evaluation findings is a mostly unrecognised, but we suggest important, evaluation bottleneck. The implication for others seeking to adopt or adapt our methodology is to make sure that early boundary critique (or scoping of the project) includes some analysis of participatory logics and perceptions of CEM. If it looks like there will be significant barriers to communicating the rationale for CEM, organisational learning across the various functions being pursued alongside CEM may need to be prioritised in addition to the systemic evaluation of the CEM itself.

6.3. *Were the systemic insights developed by stakeholders too limited?*

The third potential challenge to our systemic approach is that it examined a series of transformations required for CEM, but failed to join them up into a single, overall model of the RCS's activities. Thus, systemic insights for each transformation were generated, but not for CEM as a whole. Earlier, we illustrated our systemic CEM evaluation methodology with the example of a transformation in environmental planning, and other transformations (not discussed in this paper) were also explored in our series of workshops. Clearly, developing an environmental plan is just one link in an

ecosystem of human activities that provides a reasonable account of how community participation can lead to environmental outcomes. The outcomes brainstormed in Step 1 and then expressed as transformations in Step 2 were analysed separately in our workshops (following the systemic logic of Checkland & Scholes, 1990), but there is the potential to combine them to form a single *system of transformations* that more fully explicates the relationship between programme inputs, activities, outputs and outcomes, and provides an overall rationale for the CEM initiative. A meta-model could be produced using CATWOE and SSM conceptual modelling (Steps 4 and 5 of our methodology), as recommended by Gregory and Midgley (2000). Gregory and Midgley present a disaster planning case study using SSM and comment that, in their project, the construction of a meta-model provided a pivotal moment of insight for their nineteen stakeholder representatives, as this was the first time they were able to see their work as a ‘whole change system’.

We accept that we did not join up the transformations in this manner, and the reason is that the RCS and its stakeholders gained considerable insights from their more detailed foci, and did not express any difficulty in conceptualising how they worked together as a whole change system. We therefore made the judgement that Gregory and Midgley’s (2000) technique of meta-modelling was not required. Nevertheless, we can take this opportunity to point out that a strength of our systemic CEM evaluation approach is that, like SSM, it has the potential to enable stakeholders to zoom in and out to lower or higher levels of resolution to closely examine the causal ecosystem of activities that represent the CEM programme logic.

6.4. Is the approach transferable across cultures?

The inclusion of the DWR principle of emotional confrontation worked well in the context of our project, as it gave stakeholders and Māori permission to challenge the RCS perspective and draw out nuances in how the resource care model worked in practice. The theory of boundary critique reminds us that our intervention (in common with all OR interventions) was crafted in a specific historical and cultural context, and that the combination of SSM with DWR may not be appropriate in another culture where conflict, for example, might need to be handled differently.

We accept this as an inevitable limitation of transferring any methodology and methods across cultures, and make three points. First, the most widespread culture in New Zealand, where our project was based, is Anglo-European, and this culture (with minor variations) is dotted throughout the world, so there is still substantial potential for transferability. Second, our experience of engaging with Māori indicated no cultural barriers to participation introduced by the principles and methods. In general, it matters a great deal to Māori engaging with OR projects that researchers, clients and stakeholders respect their worldview, values and rights (Bishop, 1996; Smith, 1999; Brocklesby & Beall, 2018; Morgan & Fa’au, 2018). This is as much about the attitudes of researchers and participants as it is about the methodology (Midgley, Ahuriri-Driscoll, Baker, Foote, Hepi et al, 2007), although it is perfectly possible for a methodology to embody a limited set of cultural or philosophical assumptions and marginalize or exclude others (Spash, 1997; Midgley, 2000). Our experience in the context of this project was that the principle of emotional confrontation works equally well for Māori as it does for Pākehā (non-Māori), if used in a culturally safe way (e.g., meaningfully consulting Māori before use). However, we fully accept that this would not necessarily be the case elsewhere in the world, such as in the Buddhist Taiwanese

culture discussed by Shen and Midgley (2015). This is where our third point comes in: there is an ongoing strand of research in OR looking at the development of methodologies and methods for specific use in different cultural contexts (e.g., Murthy, 1994; Tan et al, 1995; Gu & Zhu, 2000; Midgley et al, 2000; Wang, 2000; Zhu, 2000; Midgley & Shen, 2007; Shen & Midgley, 2007a,b, 2015; Li & Zhu, 2014; Hvistendahl, 2018; Johnson, Midgley & Chichirau, 2018; Morgan & Fa'au, 2018; Romm, 2018), and we fully endorse the value of this work. Universality should never be assumed in an uncritical manner.

7. Conclusion

This paper has presented a systemic evaluation methodology to support the development of a CEM programme in Canterbury, New Zealand. We drew on Midgley's (2000) boundary critique and creative design of method to show how an evaluation methodology can be developed *in situ* in a way that was sensitive to the contingencies and constraints within the regional council. By synthesising principles and methods from SSM and DWR, the OR team and the RCS of Environment Canterbury developed and trialled an approach that identified useful process improvements and defined evaluation criteria and measures.

The systemic evaluation approach has moved the RCS towards the production of a more robust evidence base for resource care practice, as well as stronger relationships with important groups within and outside Environment Canterbury. It has done so by:

- Making the rationale and theory behind resource care activities, processes and methods explicit, helping the RCS to communicate 'what resource care is' to the community, Māori and other sections within Environment Canterbury;
- Supporting the RCS in thinking through how the relationship of their resource care model with planning and regulation mechanisms ought to be developed into the future;
- Encouraging an emerging evaluation culture within the RCS through greater awareness and appreciation for the need for evaluation;
- Raising awareness in the RCS of how to improve Māori engagement; and
- Providing a discipline, measures and mechanisms to enable the value (or otherwise) of resource care to be made more transparent, which will support Environment Canterbury in justifying or reviewing its investment in the RCS in relation to delivering council outcomes.

A number of challenges were also identified, including the way in which different understandings of 'community' and 'participation' influenced the uptake of the evaluation findings, as well as opportunities to further develop the systemic CEM evaluation methodology.

Although positive outcomes derived from the application of a methodology in just one case study are insufficient to warrant a claim that the methodology is widely applicable (Checkland, 1981; Midgley et al, 2013), a systemic CEM evaluation approach (such as the one presented in this paper) is arguably more useful than methodologies which assume

that environmental outcome measures will be unproblematic and uncontested. It is hard to establish a causal connection between the activities of a CEM programme and environmental outcomes (Bellamy et al, 2001; Gysen et al, 2006), so stakeholder involvement in agreeing on programme logic, evaluation criteria and measures is useful in establishing the credibility (or legitimacy) of the evidence produced through an evaluation. In addition, the activities of the RCS are common to many environmental management organisations and settings, so our view is that this systemic CEM methodology could easily be adapted to other contexts. However, the focus of adaptation, based on what has been reported in this paper, needs to be on the *process of engagement* with stakeholders (e.g., identifying the programme logic and designing relevant measures) and not on the measures themselves, which are likely to be specific to the RCS and the context in Canterbury.

The task now is to develop and test this systemic CEM evaluation methodology more widely, and explore the strengths and weaknesses of each test to build a more extensive evidence base for its utility, or otherwise.

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