International Journal of the Commons

Crafting Collective Management Institutions in Messy Real-World Settings: A Call for Action Research

RESEARCH ARTICLE

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ubiquity press

ABSTRACT

There is considerable interest in collective management as a potential solution to complex environmental problems, but existing research offers little guidance for the messy real-world task of creating new institutions. Research on collective management of the commons has mostly analyzed institutions that already exist, in order to derive and test general design principles to illuminate what makes institutions successful. While such principles are useful, we want to provide guidance to those who are crafting new institutions in contexts that do not conform neatly to these design principles, and to inform this crafting with insights about environmental subjectivity and social justice. We report on a study from New Zealand that applies an action research orientation, involving four case study catchments where farming and indigenous leaders are in dialogue about emerging collective institutions to address declining health of freshwater systems and other shared concerns. We show how these institutional crafters considered, challenged and stretched the general design principles as they assessed the principles' relevance to their cases, which involve externalities from diffuse pollution and hence are a less-than-straightforward collective management problem. In this dialogue, catchment leaders shared different perspectives, including concepts from indigenous culture, and explored what these mean for their own identities and motivations as farmers and environmental stewards. The dialogue has created conditions in which farmers and indigenous leaders interact as peers and partners in the enterprise of institution-building, providing an opportunity to address issues of social justice as well as environmental sustainability. We argue that commons research can benefit from (i) a theoretical agenda that reorients inquiry to practical issues of crafting institutions as well as (ii) a methodological agenda involving action research as a way of recognizing and working through complexity, while also working in partnership with local actors to achieve change on the ground.

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KEYWORDS:
collective action; IAD; design principles; water management; diffuse pollution; environmental subjectivity; critical institutionalism

TO CITE THIS ARTICLE:
Sinner, J., Tadaki, M., Challies, E., Kilvington, M., Tane, P., & Robb, C. A. (2022). Crafting Collective Management Institutions in Messy Real-World Settings: A Call for Action Research. *International Journal of the Commons*, 16(1), pp. 1–13. DOI: *https://doi.org/10.5334/ijc.1145*

INTRODUCTION

The Anthropocene is characterized by many seemingly intractable environmental problems: climate change, food insecurity, micro-plastics in marine food chains, continuing loss of biodiversity, and water shortages and eutrophication, among others. These problems are spatially heterogeneous, operate at multiple scales, and require innovative forms of coordination to address.

In showing how resource users can overcome barriers to collective action, the foundational work of Elinor Ostrom demonstrated that common pool resources need not succumb to the tragedy of the commons in situations where government intervention is absent or insufficient (Ostrom, 1990). Inspired by examples of self-regulation in complex environments (Ostrom and Cox, 2010), policymakers and policy entrepreneurs are increasingly looking to collective management and 'commoning' (Leitheiser et al., 2021; Bollier and Helfrich, 2015) in response to complex environmental problems. Some look to Ostrom's idea of nested collectives to deal with problems operating at multiple scales (Morrison, 2017). Others see CM as a way to rebuild moral relations in a world in which markets have emphasized the role of individuals (Wall, 2017).

In this paper, building upon Villamayor-Tomas et al. (2019), we define collective management of a natural resource (CM) as the coordination of resource users' behavior according to rules and norms devised by those users for the realization of mutual benefits. We distinguish collective management – a way to *achieve* mutually beneficial outcomes – from collaborative governance and other participatory approaches to reaching *agreement on outcomes*. While there is potential for these approaches to complement each other, our focus here is on collective management.

The decline of freshwater ecosystems is one issue that has attracted considerable interest in CM, particularly to address the problem of diffuse (i.e. non-point source) water pollution. In the European Union, where policy for managing diffuse water pollution has largely failed (Linton and Krueger, 2020; Bouleau et al., 2020), a recent review of agricultural policy emphasized the need for more collective approaches, stating that the "founding premise of individual, farm-level, agri-environmental measures may be insufficient to achieve their environmental objectives" (Thomas et al., 2020: p1). Indeed, since 2016 the Netherlands has required farmers to join a farmer environmental co-operative in order to receive agri-environmental payments, which are paid to the co-operative and then distributed to farmer members (Terwan et al., 2016). In New Zealand, where farmers have worked collectively to manage irrigation schemes for many years, numerous catchment groups have emerged to address wider issues including the effects of land use on freshwater ecosystems.[1]

In all these settings, people are trying to craft new collective management institutions. As researchers, how should we advise institutional crafters, e.g., on how to mobilize collective action to manage externalities such as diffuse pollution? There is a large body of literature from the Ostrom school of Institutional Analysis and Development (IAD), offering generalized principles, key elements and analytical frameworks (Cox et al., 2021), but little guidance on the process of establishing new collective management institutions where none exist. There is also recognition that there are no panaceas (Ostrom and Cox, 2010) in the face of complex social-ecological problems.

This paper takes a practical perspective on the question "How can institutional crafters organise collective management (CM) to achieve environmental and social outcomes?" First, we break down the question into three parts that confront prospective crafters and CM-enablers and review literature that can help address these questions. Second, having identified how the literature guides us but also where it falls short, we present action research as a methodological approach that can help to advance CM research. Third, we examine the emergence of CM in New Zealand and illustrate the value of action research as a way of learning while doing CM with institutional crafters. We conclude by arguing for a wider effort involving action research to address practical questions facing crafters.

WHAT DOES THE LITERATURE TELL US ABOUT CRAFTING NEW INSTITUTIONS?

As researchers with diverse perspectives, we seek to understand whether and how CM can help to address the problem of diffuse water pollution, how CM relates to matters of identity, and how CM can be done in socially just ways. In this section, we review how the literature on collective management of the commons can help us – researchers working with institutional crafters – to address three practical questions confronting institutional crafters:

1. Is CM likely to help with our problem, and if so, what institutional elements and arrangements can we assemble to achieve CM?
2. How can we marshal social identities and interests to support CM?
3. How can we address power and inequity through CM?

WHEN AND HOW SHOULD WE ATTEMPT CM?

Some problems are more amenable than others to a collective solution, so it is important to consider whether

collective management is appropriate for a given situation. This question has been addressed by an extensive literature drawing upon Ostrom's Institutional Analysis and Development framework and approach (henceforth IAD; Epstein et al., 2020; Ostrom, 2009; Ostrom and Cox, 2010). This literature offers numerous design principles and elements that suggest what situations are amenable to new CM institutions. For CM to be viable and effective, for example, the design principles recommend clear resource boundaries, clearly identified users, accountability of monitors of the resource and its use, and reasonably predictable system dynamics (Ostrom, 2009; Cox et al., 2010).

The IAD framework has since been expanded and refined to include ecological elements more directly, and to further elaborate design principles for CM institutions (Ostrom and Cox, 2010; Cox et al., 2010; Amblard, 2019; Thiel et al., 2015a). Numerous studies have used IAD to examine and assess the effectiveness of collective management of a wide range of resources, including water. In a French study, Amblard (2019) analysed six cases of cooperation between water supply authorities and farmers to protect drinking water catchments. Amblard reported that all Ostrom's factors for CM were relevant and called for further study on how impending regulation affects voluntary cooperation between users.

Few situations are likely to exhibit all the conditions identified by IAD as necessary for CM success. Still, the design principles may help guide the design of effective CM institutions to overcome less than ideal conditions. For instance, policymakers might diagnose a situation using IAD to identify where greater alignment of users can be achieved through, for example, redefining regulatory requirements (Yoder, 2019), trust building (Lundqvist 2001), or resourcing to meet informational transaction costs (Villamayor-Tomas et al 2019). In a Swedish study examining prospects for farmer co-operation to improve water quality, Lundqvist (2001) found that a lack of trust among farmers prevented collective action.

Villamayor-Tomas and colleagues (2019), examining collective institutional arrangements for addressing diffuse water pollution in France, found that although state-supported farmer groups effectively managed and monitored nitrogen, these groups collapsed once the state support ended, despite an indication that this could lead to regulation. State intervention to lower transaction costs among CM members was thus crucial for sustaining CM. In a case study of the Florida Everglades, Yoder (2019) reported how policy-induced collective liability for meeting a water quality standard spurred collective action among water users, resulting in quality improvements over a 20–year period. Changing social norms were important "to make harmful practices less acceptable or needed changes more acceptable" (p.395, citing Del Corso et al. (2017)), while also recognizing farmers' reputations and collective sense of pride in farming.

IAD thus offers a useful starting point for thinking about the situational viability of CM and the institutional arrangements that might advance environmental protection in specific contexts. As IAD proponents acknowledge, however, the design principles are simplifications of complex realities and do not offer a "panacea" (Ostrom, 2007; Meinzen-Dick, 2007) for any given situation. Moreover, there is little guidance about which principles matter in a particular case, given complexities of local history, power and place. What types of resource problems can collective institutions effectively manage and why? How do external conditions (regulation, markets, social concerns) influence the success of attempts at collective management? What adjustments are needed to the design principles and elements for groups to manage externalities? And if some of the design principles cannot be met, what then?

IAD provides a useful lexicon for characterizing the institutional landscape of a place or social-ecological system, yet offers limited insights regarding the social and cultural processes shaping identity, motivation, and power (Thiel et al., 2015b). It is important to account for such processes, lest CM ideas and principles be used to rationalize unjust arrangements or wielded by one social group over another (Agrawal, 2005; Li, 2007; Klain et al., 2014). Institutional crafting does not happen in a vacuum, and it generates more than institutional outcomes. There is a need for practical research on how IAD and the design principles are applied (or not) and why, and with what effects on the environment and society (Thiel et al., 2015b).

HOW CAN WE MARSHAL SOCIAL IDENTITIES TO SUPPORT CM?

The design principles offer guidance on aspects such as group size, resource boundaries, and ecological certainty, assuming that rationality is based on direct individual costs and benefits. As Poteete et al. (2010, p.215) noted, however, "the evidence does not support the assumption that individuals always maximize expected, short-term, material returns to self in isolation from other actors". People's actions are strongly influenced by their personal norms, which are in turn influenced by their identity, where identity includes narrative of self in place and in relation to others (Valizadeh et al., 2020; Hernandez et al., 2010; Hogg, 2020). The question of identity is therefore central, especially in externality situations where benefits of CM extend beyond the direct resource users. Researchers need to explore not just how norms affect perceived costs and benefits, but also how norms relate to identity

and how identity and norms evolve during the process of institutional crafting.

Scholarship in Foucauldian governmentality and 'environmentality' (Fletcher, 2017; Agrawal, 2005) has argued that efforts to reshape or craft governance institutions are inevitably entangled with the production of new power relations, knowledges and subjectivities. The need to align multiple stakeholders, identities, and interests to foster and develop collective management institutions is apparent to those assisting or facilitating emergent collaborative groups and collectives, but just how to accomplish this remains unclear. Similarly, the wider social implications of efforts to craft new governance institutions are not easily anticipated. Would-be institutional crafters need to assemble social interests and identities in ways conducive to collective management and sensitive to diverse and shifting subjectivities.

The IAD framework adopts a rather idealized perspective on environmental subjects. IAD largely treats resource users as rational self-interested actors who consider only private costs and benefits. Alternative perspectives, such as critical institutionalism, foreground the role of power as manifested, for example, through class, caste, and gender in producing identities, and thereby problematize the conditions that generate costs and benefits for different groups (Turner, 2017). An environmentality lens focuses explicitly on the formation of environmental subjectivities and how this relates to shifts in environmental knowledges, politics, and institutions. The emergence of new forms of government, governance and management are seen as always and necessarily entangled with the development of new ways of knowing, new power geometries, and new subjectivities in terms of how people relate, individually and collectively, to the environment (Agrawal 2005). Environmental subjectivity is not so much an alternative to self-interested rationality as it is a means to understand the social forces that influence how costs and benefits are perceived.

The literature therefore highlights important aspects of identity and identity formation that can inform researchers and institutional crafters in their efforts to assemble societal actors and marshal interests for collective management. For example, those with a legitimate stake in a given resource or environmental issue potentially comprise a much wider set of identities and interests than conventional stakeholder analyses may suggest (Billgren and Holmén, 2008). For crafters of new CM institutions, this has implications for who should be recruited as well as the range of interests that will affect the motivations of potential members. Furthermore, interventions to foster change must recognise that environmental subjectivities are dynamic, constantly being produced and re-shaped as people's relationships with the environment are mediated through changes in governance and management. Collective subjectivities take time to develop, and emerge out of processes of 'commoning' in the sense of collective action to implement and maintain a shared purpose (Bollier and Helfrich, 2015). Institutional crafting therefore must also attend to and support the process of *enacting* commons, rather than starting from a pre-given notion of already-existing common pool resources.

While awareness of subjective identities is an important step in understanding motivations for CM, the environmentality literature does not go so far as to provide guidance or practical strategies for institutional crafters – whether resource users, allies or intermediaries – on how to navigate and negotiate evolving subjectivities. There is a need for researchers to observe and report on how subjectivities change as new CM institutions emerge and then, based on this, to offer guidance to crafters.

HOW CAN WE ADDRESS POWER AND INEQUITY THROUGH CM?

Institutional change does not occur through a straightforward application of will. Institutions have inertia, there are interests invested in certain institutional arrangements, and not all social groups have the same capacity or political influence. Prospective institutional crafters are confronted with a tangled mess of power relations, institutional arbitrariness, and political history that all shape the institutional options available in any situation. If mainstream institutional thinking implies a rational and intentional designer who creates institutions, the emerging field of critical institutionalism contends that institutions are entwined in people's everyday practices and evolve through a dynamic process of bricolage—borrowing ideas and mechanisms from elsewhere and adapting them to local circumstances (Cleaver and De Koning, 2015). Institutional change that occurs as bricolage rather than purposeful design presents opportunity but also risk (Cleaver, 2017). Opportunity arises from the potential for new mechanisms to reconfigure current power relations, and risk from the potential for elites to capture the adaptation process to protect or reinforce the status quo. While rational diagnosis and intention can be part of institutional change through bricolage, bricolage also includes subconscious and unintentional actions and outcomes (Whaley, 2018; Cleaver, 2017; Cleaver and De Koning, 2015). As explained by Mosse (1997):

> *[institutions] always enmesh with and emerge out of people's systems of meaning and culturally accepted ways of doing things. As a result, institutions tend to reflect, and often entrench, historically specific power relations* (cited by Whaley, 2018: 139).

Arrangements for sustainable collective use of resources are not always equitable. Agrawal, for instance, showed that when community forest rules were breached in rural India, less privileged villagers were sanctioned more often than elites (Agrawal, 2005). On Vancouver Island, Klain et al. (2014) found that while the sea cucumber fishery "is relatively ecologically sustainable according to stock assessments" (p1), First Nations consider these arrangements unjust as they restrict customary harvesting rights. Institutional crafting is thus a power-laden process that benefits some groups over others, and over which social groups are able to wield different levels of influence. Critical institutionalism therefore foregrounds power and meaning "as constitutive features of all governance arrangements" (Whaley, 2018: 140), highlighting social attributes, political economy and discourse as key to understanding how institutions function and change. Whaley (2018) promotes CIAD (Critical Institutional Analysis and Development) as helping address the challenges facing critical institutionalists: achieving policy relevance, identifying relevant scales of analysis, and grasping how power infuses governance.

Critical institutionalism's complementary focus on power and meaning helps identify political stakes and social processes implicated in institutional change. By identifying the ways in which uneven social power shapes institutional change processes and their benefits, institutional crafters can think proactively about how and with whom to engage. Crafters can be aware of uneven access to governance conversations, institutional inertia and bricolage, and the need to proceed consciously and carefully through elite power networks. In this paper, we show how a new research orientation can help us to develop guidance on practices and processes that can be used by institutional crafters to render more than CM, i.e. CM that is also just.

ACTION RESEARCH TO ADVANCE KNOWLEDGE AND PRACTICE OF COLLECTIVE MANAGEMENT

How can collective management researchers assist those wanting to craft new institutions? Cumming et al. (2020) recommend a research agenda focused on deriving more consistent definitions and measures, fully specified models of relationships between system elements, and systematic testing of hypotheses with data and models. This, they contend, will generate "a more rigorous understanding of how to design or foster effective, resilient institutions for environmental governance and management" (Cumming et al., 2020: p. 32).

While such an approach may yield useful insights, we consider that research that engages with people trying to craft new institutions is also required to understand the complexity of this process. The benefits of this can be seen in the work of Lundqvist (2001) and Yoder (2019), whose insights were possible because they engaged directly with farmers to go beyond IAD elements and design principles. This kind of embodied learning reflects the intent of Ostrom and the idea of 'no panaceas' (Ingram, 2011; Meinzen-Dick, 2007), rather than trying to derive a set of standard conditions that would lead to collective management, using policy levers or intentional design to create these conditions, and assuming or hoping that effective CM will emerge. Meinzen-Dick et al. (2004) noted both the potential and challenges in using action research (AR) to study collective action, citing Sultana and Thompson (2004) as an example. Poteete et al (2010) also called for methodological diversity, acknowledging the insights obtained through case studies and ethnographic research. Yet few AR studies of collective action have emerged.

Action research involves researchers and participants jointly undertaking interventions to improve real-life outcomes (Brydon-Miller, 2008; Stringer, 2008) and encompasses a "spectrum of activities" that involve an iterative process of theorising, action, evaluation and learning (Cunningham, 1993). AR is not so much a methodology as an orientation to inquiry, engaging as inquiring co-researchers those who might otherwise be research subjects (Reason and Bradbury, 2008). This involves bringing together the knowledge and questions of researchers and practitioners in a shared attempt to change social arrangements while also learning from this process. As each party offers insights, knowledge and perspectives on the other's questions, new perspectives emerge. Further cycles of inquiry shape both the answers and subsequent questions. AR is thus distinguished from (or a special subset of) conventional case studies in that AR involves a purposeful attempt to *change* social arrangements, for example by crafting new arrangements for collective management of a shared resource.

Two features of AR make it well-suited for studying the process of crafting collective management institutions.

First, AR is transparent about the normative positionality of researchers (Meinzen-Dick et al., 2004). Normative positionality typically involves an orientation in favor of an outcome such as ecological sustainability, economic efficiency, democracy or social equity, or more specific objectives related to a particular case. Non-AR work on collective institutions is often also normative, but less transparently so. For example, IAD focuses on efficiency of CM institutions to protect resource sustainability rather than, say, social justice or democratic legitimacy.

Identifying and describing design principles has never been simply a matter of positivist science – it is intended to assist institutional crafters to achieve particular ends. AR offers a path for responsible constructive research, intervening in local CM situations with deliberate and transparent intent.

Second**,** AR opens up the black box of crafting new institutions and enables researchers and CM crafters to learn together through shared enquiry, recognizing that researchers are not the only sources of wisdom. The IAD literature has elucidated design principles from CM institutions that already exist, whereas crafters need to know "how did they get there?" In AR, we can benefit from the knowledge and insights of institutional crafters in real time as they respond to external forces and navigate local political interests and elites, managing the tensions between one design principle and another. It enables testing of assumptions and responding to unintended outcomes and surprises, rather than just noting them retrospectively.

Thiel et al. (2015b), citing Alexander (2005), made a similar point, proposing an approach to "purposeful institutional change" in which:

> *institutions are conceptualized as being endogenous to actors, and intended institutional change becomes effective through reshaping actors' perceptions and cognition. From this perspective, knowledge about how to effect institutional change in desirable ways cannot be produced independently from the subjects of such change in corresponding SES situations…* (Thiel et al., 2015b: p. 82).

We read this as a call for action research. But apart from the few studies mentioned here, there appears to be a dearth of AR to study the process of crafting collective institutions and arrangements. In the following section, with examples from New Zealand research on catchment collectives and freshwater management, we show how an AR orientation can assist institutional crafters and stretch theory. Our research questions start with our interests and orientations concerning how existing theory can help institutional crafters. From these, we continue to review and adjust our interventions based on exchanges with our partners in crafting new collective institutions.

WATER COLLECTIVES IN AOTEAROA NEW ZEALAND

Water management in New Zealand represents an active site of experimentation in which to investigate the crafting of collective management institutions. Like many other countries (Bouleau et al., 2020; Amblard, 2019), New Zealand has failed to manage diffuse water pollution from agriculture that has driven significant deterioration in freshwater ecosystems (OECD, 2017). In New Zealand, increased use of synthetic fertilizers, high stocking rates, and intensive horticulture and silviculture have led to increasing nutrients, *E. coli* bacteria, and sediment polluting waterbodies (Ministry for the Environment and Stats NZ, 2020). In response to high public concern (Hughey et al., 2019; Hughey et al., 2010; Parliamentary Commissioner for the Environment, 2004), successive governments have implemented a series of national policies to reverse decline in key freshwater attributes (Ministry for the Environment, 2021). The latest policy lists 22 standards, for which the primary mechanism to achieve improvement is individual farm plans. By 2025, farms with more than 20 hectares (five hectares for horticulture operations) must develop and implement a farm plan specifying how they will mitigate the environmental effects of their farming activities. While the regulations governing these plans are not yet published, the government has indicated that plans must be approved by a certified agent and regularly audited (MfE and MPI, 2021).

As noted above (Thomas et al., 2020), individual farm-level measures are likely to be insufficient to achieve freshwater objectives. Unless coordinated at catchment and sub-catchment scales, farm plans are likely to default to lowest common denominator "good management practices" that are affordable for the farmer, rather than practices designed to achieve specific place-based environmental objectives by addressing locally significant stressors, which often require coordination across property boundaries (Sinner et al., 2020). For example, many New Zealand catchments have excessive nitrogen loads from intensive dairy farming. Farm plans specifying good management practices can reduce nitrogen loss to waterways but provide no assurance that this will restore ecological health and do not address situations where problems can only be resolved through more far-reaching land use change.

Catchment groups are a potential way to coordinate actions of farmers to achieve environmental objectives.[2] Catchment groups have existed in New Zealand for many years, often to manage a shared resource such as irrigation water (Boone and Fragaszy, 2018). Other collectives have arisen around shared goals such as pest management and habitat restoration for threatened species (NZ Landcare Trust, 2019; Peters, 2019). The existence of these groups is increasingly acknowledged and understanding more about them is a major topic of policy and research interest (Biological Heritage NSC, 2019; Ministry for Primary Industries, 2021).

The role of Māori (New Zealand's indigenous people) in freshwater decision-making is underpinned by the Treaty of Waitangi of 1840. Although the Treaty was long ignored (see e.g. King, 2003), since the 1970s there has been increased recognition of Treaty rights and principles, including settlement of historical grievances with many tribes (Sullivan, 2016). The national directive on freshwater policy in 2020 requires regional water authorities to actively involve local Māori in freshwater management, in recognition of their historical and on-going rights and interests in land and water (Ministry for the Environment and Ministry for Primary Industries, 2020).

Understanding catchment groups and supporting them to address water quality issues is the primary purpose of our research. Rather than opting for a large sample approach by surveying groups, we created two mechanisms to explore collective action: (i) a catchment forum with on-the-ground actors and (ii) a policy advisory group with people involved in water policy and regulation, including industry and Māori perspectives. The catchment forum includes a farming leader and Māori representative from each of four catchments across New Zealand, which have diverse starting points and conditions. In this forum, we have discussed theories of collective action and asked participants about their motivations and strategies for establishing CM, the applicability of the design principles to their situations, and the opportunities and challenges for CM in hypothetical scenarios. These discussions are all with the dual purpose of (i) supporting forum members to establish and strengthen CM arrangements in their local settings and (ii) advancing understanding of the process of institutional crafting in real time.

We are interactive in our sensemaking – the six-monthly catchment forum is a place to learn from each other, while workshops and online meetings with the policy advisory group allow us to test the forum's ideas with policy actors and vice versa. We also undertook 16 semi-structured interviews with forum members, other farmers and local government officials to explore the preconditions and drivers of catchment groups' work. Through this interactive process, we are testing assumptions of IAD theory while gauging and enabling change. While we are still on this journey, we report here how our experience to date takes us beyond traditional IAD to advance both theory and practice of CM.

EMERGING OUTCOMES AND INSIGHTS

Drawing on our interviews and the Catchment Forum activities, we show how an action research orientation has enabled us – researchers and catchment leaders – to mobilize theory and knowledge in the project of crafting new institutions. In particular, an action research orientation enabled us to address the three questions posed at the start of this paper by:

1) applying the IAD design principles in a practical setting with the aim of addressing rather than just observing deficiencies in the principles,
2) engaging creatively with environmental subjectivity and social identity instead of having CM be 'victim' to existing identities and subjectivities, and
3) forging new social relations that create better preconditions for environmental justice within and beyond the frame of collective management.

We consider these in turn.

1. HOW DO WE CRAFT A NEW CM INSTITUTION IN OUR LOCAL CONTEXT?

In our second Catchment Forum, we 'road tested' the design principles to evaluate their utility from the perspective of institutional crafters. We translated the principles, as articulated by Cox et al. (2010), into plain language and discussed these principles as a group. Each Forum member indicated three or more principles that were most relevant to their catchment groups and identified other principles that had little or no relevance. The exercise, discussed in greater detail in Tadaki et al. (2021), exposed the gap between the situations analyzed by IAD theory and the situations facing catchment groups.

One such divergence was on the design principle of proportionality, which we translated for the Catchment Forum as "Individual contributions to caring for the river should be proportional to the individual gain from using the catchment" (Cox et al. (2010) state this principle as "Congruence between appropriation and provision rules and local conditions: The benefits obtained by users from a CPR, as determined by appropriation rules, are proportional to the amount of inputs required in the form of labor, material, or money, as determined by provision rules"). Catchment Forum members said this principle had little relevance for advancing catchment groups. In their experience, at least at the start, leadership from a small number of champions is required. Catchment group leaders often invest a lot of time and resources in caring for the river, despite the benefits being widely shared.

One member said, "I think you will always have carriers, leaders. Those that put in a lot more than others within any situation." And, "if you're thinking about fair in any sort of collective management, you'll never get fair. That's just a myth. It's a thing that we aim for that's not there, and I think we're better to recognise it."

It is possible, of course, that this perception could change over time. As a catchment group sets objectives, monitors them, and gains more clarity over what is needed to achieve its goals, it may decide at some point to confront those who are seen as not doing their 'fair share'. But members of our Catchment Forum felt it was not appropriate to do so now, when the groups are still establishing themselves. This highlights that the design principles – developed from studying groups that already exist – cannot be applied 'as is' by those crafting new institutions. Taking an action research orientation and reflexively testing the design principles with Catchment Forum members led us to a deeper understanding of the dynamics shaping catchment groups, what we can and cannot borrow from IAD more generally, and why.

2. MOTIVATIONS FOR CM: FORGING NEW IDENTITIES

Institutional crafters, and researchers assisting them, should seek to understand the diverse motivations that influence people's decisions to initiate or participate in collective management. The IAD framework generally assumes that people act on the basis of self-interest, that is, that collective action is only possible when it generates a net benefit for all group members. In externality situations such as diffuse water pollution, self-interest is not sufficient to motivate collective action unless there are conditions that create some accountability for the costs imposed on others. Under this framing, without conditions to provide that accountability, such as state regulation, there is likely to be no collective action.

Yet many farmers, including members of our Catchment Forum, are engaged in pro-environment activity and collective action despite the absence of a financial benefit because, for example, they see environmental stewardship as part of being a good farmer. On a field trip with the Catchment Forum, one farmer told us:

> *I feel a connection to it [the water]. I've fished all my life and I've always taken care of what we do in and around the water. … When Dave rung up [and asked me] to join the Pourakino Group, it was a no-brainer for me as it's what we do every day anyway as a farmer.* (Pourakino field trip, March 2020)

When we interviewed Forum members, we heard numerous extra-rational motivations behind CM involvement, linked to identity and sense of place:

> *Dad would have swum in that as a kid and I swum in it as a kid, and really our kids should be able to swim in it, too.* (Interview, October 2020)

> *I do enjoy the catchment part of it. Get everyone in a meeting and you get to meet a lot more people, all your neighbors. That's been quite a good aspect of it.* (Interview, October 2020)

> *I always wanted to farm so when we came here we decided on an open gate policy that as many people who wanted to use this farm could, so long as they looked after it respectfully, shut the gates and didn't drop litter.* (Interview, September 2020)

For our Forum members, place-identity carries responsibilities. For indigenous people, this has special meaning because of cultural attachments to land and water nurtured over centuries. Using an action research orientation, our aim is to foster shared place-based identity with a common purpose among farmers and tangata whenua (Māori with ancestral connections to local land), who have traditionally had little interaction. We have seen some evidence of a shared identity emerging:

> Tangata whenua Forum member: *When I was with [the catchment] group, … I said: "Greet the river." When you greet the river, then you have a relationship. When you greet something, there's a relationship, and it's no longer a thing. When you're in a relationship, then you want to take care of it […]*
>
> Farmer Forum member: *Yeah, it's interesting when you say that, when I think, say, from my farming perspective. So say for me, it's the land and the cows that are my resources, essentially. But, if you go in with an attitude that, "What can I get out of them?" then it only lasts for so long before you run into issues. But if you think "how can I look after these, because if I look after these, they look after me". So if I can look after my stock and my land, so that they're healthy, then they actually look after me. From an economic point of view, it actually works out far better, and you feel a lot better about what you do. It gives you meaning and purpose.*
>
> Tangata whenua member: [Affirming] *Kia ora, and you relate to it. You have a relationship with your land, with your animals, with everything that's around there.*

We see here multiple aspects of how the farmer is reconsidering his relationship to his animals and land. First, he identifies that seeing them as "resources" is short-sighted and leads to "issues". Then he acknowledges the animals and land as having agency – "they actually look after me". Third, he comes back to economics, adjusting his own worldview by recognizing that "from an economic point of view, it actually works out far better". And finally, he

goes beyond financial considerations to a new appreciation of what this relationship with land and his animals means for his identity a farmer: "you feel a lot better about what you do. It gives you meaning and purpose."

Although conventional IAD thinking conceptualizes people as self-interested rational agents, the motivations driving catchment group leaders are not helpfully represented by these terms. Instead, peoples' identities and place-based responsibilities seem to be key motivators for action. Through our forum, we have chosen to actively foster and strengthen this identity, creating the conditions for a cross-cultural identify of catchment stewardship as a long-term strategy for enabling collective management. This demonstrates how action research can be performative – seeding ideas and encouraging participants to see the world differently, to open up to new potentialities and re-imagine one's personal identities and subjectivities relative to the environment and to other people.

Social identity might thus be an important variable for formal analysis of efforts to establish CM. However, more research is needed to understand how different identities and their effects on CM can be characterized. Because motivations, i.e. perceived benefits and costs, are central to efforts to establish CM (Poteete et al, 2010), and because motivations are rooted in social identity (Fielding et al., 2008), we consider this a fruitful area for inquiry.

3. FOSTERING CONDITIONS FOR JUSTICE IN CM

Third, collective management produces outcomes not only for environmental health, it also has implications for environmental justice. New institutions will, intentionally or not, have consequences for the distribution of power. AR invites researchers to reflect on, and make conscious choices about, their moral positionality with respect to potential consequences.

In New Zealand, tangata whenua have for centuries practiced care for the land and water and, through genealogy, are still the inherited *kaitiaki* (stewards). In some areas, Māori remain significant landowners but in most areas they have little or no land, as a result of colonization. Recent policy to increase the role of tangata whenua in environmental decision-making provides an impetus and an opportunity for Māori leaders and emergent catchment groups to find ways to work together. In doing AR with catchment groups in the process of crafting new institutions, we asked ourselves and our research partners, what roles and relationships should indigenous environmental custodians have with catchment groups?

The default norm in this arena would have been to build our research project, and our catchment forum, around catchment groups as something that farmers do, and seeing tangata whenua as having different roles and activities. We preferred an approach that recognizes and learns from the stewardship practiced by indigenous people historically and in the present day. We chose to involve both tangata whenua and farmer-leaders as 'catchment group leaders' who merit an equal place in the Forum.

In three of our four case study catchments, the farmer and tangata whenua members of our forum had never met prior to our forum. By creating a dialogical space – our recurring Catchment Forum meetings – where these leaders can see each other as equals engaged in a shared pursuit, the research provides a setting for creating and strengthening these relationships. This aims to enhance the prospects for CM in these areas and sets an example of 'good practice' for CM across New Zealand, including recognition and support of tangata whenua custodianship.

We foster these relationships in various ways, firstly by bringing farmers and tangata whenua together in the same room to hear and acknowledge each other's histories, challenges and perspectives. The farmer and tangata whenua members from the same catchment often travel together to forum meetings. Each pair also works together to host a meeting of the forum in their catchment, where other tangata whenua and catchment group members are invited to attend and hear the others' perspectives. And in the forum itself, farmers and tangata whenua work in catchment pairs to report on what is happening in their catchment, assessing their needs and how these could be met – all of which nurtures a partnership for co-designing future action. In one case, the tangata whenua member has twice visited the dairy farm of his forum colleague, who has in turn visited the tree nursery managed by tangata whenua. The two are now working together on forming a new catchment group. This shows how, through action research, we can foster new partnerships, and how these partnerships can start to address historical imbalances in power.

CONCLUSIONS

Research on collective management of the commons has been dominated by studies that review multiple cases and attempt to derive generalizable features that characterize successful institutional arrangements. These design principles, when translated for local contexts, can provide some general guidance to those seeking to craft new institutions. But this literature only goes so far. It does not answer critical questions about how the design principles can inform the crafting of new institutional arrangements in a specific context, including externality situations that rely on more than narrowly defined self-interest to motivate action. There are also other literatures such as

critical institutionalism and environmentality that provide insights to help us critique CM institutions, but these do not guide those seeking to craft more just institutions.

Action research is an alternative orientation for commons research that offers promise for shedding new light on the process of crafting and establishing new collective institutions. In our forum, where we support members' efforts to establish and strengthen CM arrangements in their local settings, we have learned with them about the opportunities and challenges for CM and where theory needs further development. Thus, we argue, commons research can benefit from a new theoretical agenda that reorients inquiry to practical issues of crafting institutions (rather than documenting what exists), as well as a new methodological agenda – action research as a way of recognizing and working through complexity rather than abstracting from it, while also working in partnership with local actors to achieve change on the ground.

We have highlighted here how an AR orientation can help us to understand the process of institutional crafting. We recognise, of course, that AR has its own challenges. AR participants may resist venturing into contentious areas or may exhibit tendencies toward "othering", and AR discussions may be susceptible to self-confirming narratives, to name some of the challenges that we have identified. As researchers, we see these not so much as limitations of AR but rather as challenges to be met by AR practitioners. By offering structured opportunities to reflect on practices of knowledge-building, researchers with an AR orientation can help institutional crafters to make sense of the world and to act to make the world a better place.

NOTES

1 See *https://www.landcare.org.nz/completed-project-item/catchment-groups* and *https://beeflambnz.com/your-levies-work/community-catchment-group-programme* for maps showing details of some of New Zealand's many catchment groups.

2 We define catchment groups as voluntary collectives of land users (and sometimes others) who coordinate action on private land within a catchment (a.k.a. watershed) or sub-catchment. Actions can include advocacy, sharing information, and undertaking activities such as riparian planting and pest control.

ACKNOWLEDGEMENTS

We thank the members of our catchment forum for their time and commitment to learning with us about crafting new institutions for collective management. We also thank our two anonymous reviewers for their constructive suggestions, including an observation that design principles generally reflect assumptions of narrowly defined rationality, whereas social identity offers a means to explore alternative motivations. This research was funded by New Zealand's Ministry of Business, Innovation and Employment through Our Land and Water National Science Challenge.

COMPETING INTERESTS

The authors have no competing interests to declare.

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TO CITE THIS ARTICLE:
Sinner, J., Tadaki, M., Challies, E., Kilvington, M., Tane, P., & Robb, C. A. (2022). Crafting Collective Management Institutions in Messy Real-World Settings: A Call for Action Research. *International Journal of the Commons*, 16(1), pp. 1–13. DOI: *https://doi.org/10.5334/ijc.1145*

Submitted: 11 August 2021 Accepted: 14 January 2022 Published: 01 March 2022

International Journal of the Commons is a peer-reviewed open access journal published by Ubiquity Press.