22 reasons why collaborations fail: Lessons from water innovation research

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ABSTRACT

Bold and inventive solutions are urgently needed to safeguard the future use of water. In response, collaborative-innovation is increasingly championed. If stakeholders including water utilities, supply-chain companies, research institutions and local communities work together, share their experiences and pool ideas, meaningful change could happen, it's argued. But effective collaboration is far from easy. For every incentive that drives collaboration forward, another barrier blocks its path. Whilst the literature offers many possible factors that influence the success (or failure) of collaborative-innovations, it remains unclear which factors are most important, where the highest agreement and disagreement exists, and if accommodating one factor creates problems for another. This is important because its not always practical, nor necessary, to apply everything from the academic literature. In this paper, we report findings from an international systematic literature review that brings together a range of studies that cross the water collaboration and water innovation divide. We identify 22 broad themes that are spread (unevenly) across the entire collaborative-innovation process; highlight how the level of attention given to each theme varies greatly; and where disagreement exists. Our research provides practical insights on how to create more effective collaborative-innovations in water and where future research should be directed.

1. Introduction

As environmental problems become more complex, contentious and challenging to solve calls have grown for the involvement of more stakeholders in environmental decision-making. In water management, collaboration is often heralded as a solution. It can help stakeholders with different needs, capacities, and experiences work together to improve the decision-making *process* and its *outcomes* (Margerum and Robinson, 2015). Collaborations can encourage a more inclusive and participatory ethos where different perspectives are valued, efforts are better aligned to reduce duplication and increase efficiencies, as well as offering the opportunity to resolve longstanding conflicts (Margerum, 2011).

Yet critical scholars raise questions over the extent to which collaborations work (Bodin, 2017), and in turn, if a darker side of collaborations exists (Kallis et al., 2009). For instance, the framing of collaborative efforts can be used by those with greater access and expertise to exclude certain voices or knowledge types. Such practices speak to not only the crucial role played by power but also the deeply political nature of water itself, how its managed, for whom, and to do what

(Harrington, 2017; Margerum, 2002). Who gets involved, has a say, benefits or pays, all tell us a great deal about the transparency, accountability and legitimacy of collaborative processes as a democratic deficit opens up, not closes (Kallis et al., 2009; Margerum and Robinson, 2016). Inconsistencies in how we define and use collaboration[1] add further complications (Emerson et al., 2011; Margerum and Robinson, 2015). Even when these concerns are considered other practical challenges remain.

Findings from collaborative water studies are often criticised for being too locally focused or lacking generalizability. As Leach and Pelkey (2001) explain, this means the literature risks comparing apples with oranges, relying on empirical research from only one or two case studies, each with different methods, policy contexts, regions, and sectors (cf. Emerson et al., 2011; Robinson et al., 2011). Indeed, Sabatier et al. (2005) lambast the field for failing to develop an empirically grounded theoretical framework. This makes it difficult for researchers and practitioners alike to discern what are the dos and don'ts of water collaboration. If the literature disagrees on these dos and don'ts it is even harder to know where to start. Where water collaboration theories have been applied, such as institutional rational

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[1] For the purposes of this research study, we will be exploring the combined role of collaboration and innovation in water. We define collaborative-innovations as a 'process in which multiple stakeholders (outside a single organization) contribute towards creating and developing new products, services, processes and solutions'.

choice (Ostrom, 1990), the political contracting (Benson et al., 2013), and the advocacy coalition frameworks (Sabatier et al., 2005), the focus tends to be on the self-maximising interests of actors that make them want to work with others as opposed to how the collaborative process should be run. Whereas the collaborative model developed by Ansell and Gash (2007) explains how to create a more harmonious, and fair, process it says little about whether the factors involved are transferrable from one context to another.

For water management, a pressing concern is how to secure access to clean water under increasing pressure from growing populations, climate change, pollution, and aging water infrastructures pushed to their limits (Kiparsky et al., 2013; Speight, 2015). To stop water becoming too expensive, dirty and scarce, innovation is urgently needed. If existing water sources can be better used, new sources better exploited, consumers make better use of water, and governments better support research and development, it's argued that many water problems could be tackled (Moore et al., 2014; Thomas and Ford, 2005). But the water sector is, understandably, conservative. It is responsible for supplying safe, reliable, and affordable water. The sheer size, complexity and longevity of water infrastructures make repair and renewal preferable to change (Dobbie et al., 2016); safe treatment of water makes tried-and-tested technologies preferable to experimental ones (Speight, 2015); skill shortages or silo-thinking make it hard for managers to embrace new ideas (Kiparsky et al., 2013); and regulatory environments where price rises are discouraged can make large-scale investments challenging (Thomas and Ford, 2005). This institutional culture, coupled with the organisational norms and the staff behaviour it shapes, can stifle innovation. As a result, water providers are increasingly looking to collaborate with others, including research institutions, supply-chain companies, and communities, to help them innovate.

In this critical review, we aim to understand the main factors that influence the success or failure of collaborative-innovation in water. We update and go beyond the previous Leach and Pelkey (2001) review of watershed partnerships by covering a more contemporary period of literature, having a more inclusive geographical scope and focusing particularly on collaborative innovation in the water sector. To do this, we conducted a systematic literature review of peer-reviewed publications, over a twenty-year period: 1996–2016. In what follows, we explain our data and methods, before highlighting the broad range of themes identified, which themes are best supported by the literature, and whether there is agreement over which themes are most important. We map the data onto five interrelated questions about the collaborative-innovation process: what is needed to initiate the process, who should be involved, how work together, how to design the process, and importantly how the process should be run. To close, we argue that whilst there is strong agreement about key factors that influence the success of collaborative-innovations, researchers and practitioners alike should be wary of applying these factors uncritically.

2. Data and methods

To understand what are the main factors that influence the success of collaborative-innovation in water, we conducted a systematic literature review of empirical papers. In water research, systematic literature reviews have gained a reputation as a robust method for identifying, analysing, and synthesising large bodies of literature (Stefanelli et al., 2017). Whereas traditional literature reviews seldom justify what search or selection criteria they used, systematic literature reviews make this explicit to improve the transparency, accountability and reproducibility of the results – so that other researchers have a baseline from which to check and build upon in future studies (Porter et al., 2014). In turn, systematic reviews also allow for a more critical and consistent engagement with studies by prioritising empirical evidence over preconceived knowledge, which is crucial when tracing how understanding has changed over time.

We used ISI Web of Science, the largest and most comprehensive research publication database, to perform a keyword search for journal articles published between 1st January 1996 and 1st October 2016. Articles published before 1996 were excluded, as Leach and Pelkey's (2001) review on watershed partnerships already covered this period. As 'collaboration', 'innovation' and even 'water' are understood differently across disciplines, fields, and scholarly traditions; we used different keyword combinations for each so that the fullness of the topic was covered. The same is true for how 'success' or 'failure' are conceptualised.

In total, 843 keyword searches were conducted, from water*, collaborat*, innovate*, to driver* and barrier* (see Supplementary Materials for a full list of keyword searches). 2944 papers were returned. Once these papers were imported into Endnote software, we applied an inclusion and exclusion criterion. Only empirical, peer-reviewed publications (not books), written in English, which evaluated the process of collaborative efforts in water innovation, were included. For instance, studies that focused on the development of innovations rather than on the teamwork that brought them about, such as trials of microbes that change colour in polluted water, were excluded.

48 papers were retained for further analysis. To prioritise the highest-quality, and most empirically-robust, studies we ranked these papers using a scoring system from one to five. Five star papers were clearly executed, used reliable research methods, and were critically analysed. Large-scale surveys of discrete groupings, using appropriate statistical techniques, or multi-method approaches using in-depths interviews and surveys, met this criterion (see Supplementary materials for full details). To ensure consistency, the scores were double-blind checked by both co-authors, independently, to identify any papers that fell between two rankings. 26 papers (0.88% of the initial search) met the inclusion criteria, scoring three stars or above. As shown in Table 1, these papers include different research methodologies, geographical regions, and collaborative contexts (e.g. watershed partnerships, urban water governance, and water supply, treatment and conflicts).

To analyse the data, we developed a qualitative scorecard to record each paper's characteristics – authorship, research overview, methods used, key findings. A central question put to the studies was: what influences the success of collaboration in water innovation? We performed a content analysis to convert the qualitative findings from disparate papers into a meaningful set of general underlying themes to allow comparative discussion of the literature (Haslam and McGarty, 2014). After reading each paper, the conclusions were summarised whilst remaining faithful to the original meaning and language, also known as *condensation* (cf. Erlingsson and Brysiewicz, 2017). 238 distinct conclusions (an average of 9 per study) were identified (see Supplementary materials). Each conclusion was given a *code* that closely described, in a few words, its condensed meaning (e.g. risk aversion, risk-taking, too uncertain). We then grouped the codes into *categories* that described different aspects, both similarities and differences, of the text that belonged together. Lastly, to capture the underlying meaning of each category we defined 22 higher-level *themes*, as shown in Table 2. Of the 238 conclusions, 208 fitted well within the 22 themes, whilst the remaining 30 (none of which were identified by more than 2 studies) were not categorised.

3. Results: what factors influence the success (or failure) of collaboration in water innovation?

Close inspection of all 22 broad themes reveals several patterns. First, themes are spread (unevenly) across the collaborative-innovation process, from how to initiate the process, 'who' should be involved, and how to get everyone to work together, to how to design and run that process. Second, the level of attention given to each theme in the empirical studies reviewed varies from the central focus of the analysis to a side-note. Although the frequency with which a theme is cited should not be confused with its importance, recurrence may indicate that it