

Resource Management, Sustainable Development and Governance

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Approaching the Collaborative 'Turn' in Water Governance: A Critical Re-appraisal

Nigel Watson
Lancaster Environment Centre
Lancaster University
Lancaster, UNITED KINGDOM

Rob de Loë
School of Environment, Resources and Sustainability
University of Waterloo
Waterloo, Ontario, CANADA

Introduction

Complex, inter-connected and seemingly intractable problems involving natural resources and the environment require innovative responses and, where possible, similarly creative and novel solutions. For at least the last several decades, geographers and scholars in allied disciplines have known this to be the case. Throughout his entire career, Bruce Mitchell has been a key figure and prolific writer on a wide range of matters related to innovative environmental problem-solving and approaches to decision making. In particular, he has led efforts to understand and improve institutional and organisational arrangements for integrated resource management and governance, sustainability and resilience. In this regard, Bruce Mitchell exemplifies the ethos that an academic should be driven by both intellectual curiosity and a desire to make the world a better place for present and future generations.

Regarding institutional and organisational arrangements, in the last twenty years increased attention has been drawn by policy makers and academics to innovative approaches involving collaboration. Whether the challenges relate to climate change, natural or technological hazards, resource use or consumption, or any other type of problem involving the environment, it seems that almost everyone believes that 'collaboration' is necessary for developing viable policy responses and implementing effective solutions. The emergence of collaboration as a favoured mode of operation is not unique in this regard, and other ideas such as public participation and grass-roots or bottom-up decision making have all had their moments in the spotlight. Equally notable, however, is how the 'turn' towards collaboration has spread so widely and rapidly, to the extent that collaborative working may now actually

constitute a new natural resources management paradigm (Holley, et al. 2012). However, the paradigmatic shift and turn towards collaboration appear to be happening without very much explicit inquiry or critical reflection apparently having taken place. There is ample literature advocating greater collaboration as an answer to the major resource and environmental challenges faced by society, but considerably less published research critically examining the concept or challenging its underlying norms and assumptions. In much the same way that inter-agency co-operation became a myth for resource management in the 1980's (Dorcey, 1987) it appears that collaborative resource and environmental management has become an idea that many people choose to firmly believe in and advocate, but not necessarily on the basis of a full and careful appreciation of what is likely involved, the important factors or conditions which can influence success and potential risks and limitations, in addition to potential positive impacts and benefits. Furthermore, collaboration is increasingly applied to resource planning and governance, in addition to management, and also many other policy areas such as public health, social care, national and international security, education, transportation, and urban, rural and regional development. As such, the early 21st century appears to be an era defined by cross-scale inter-agency and multi-party collaboration, in much the same way that the twentieth century was defined as an era of big government and industrial conglomeration.

Given this clear increase in the popularity of collaboration, and a rise in the number of applications, the time has come for a detailed and systematic examination and critical appraisal of collaboration, taking into account literature from both inside and beyond the field of natural resources, and insights from equally important practical experiences. A fully comprehensive and detailed assessment of collaboration is beyond the scope of this chapter. Nevertheless, our goal here is to add to the on-going scholarly debate and appraisal of collaboration by shedding some further light on collaborative processes and arrangements. Through this short contribution, we hope to encourage deeper and more critical understanding of collaboration in the spirit of supporting future developments and successful applications. The chapter is organised as follows. First, attention is given to examining the meaning of collaboration and defining characteristics which can help to differentiate collaboration from other types of interaction, along with potential benefits and costs. In the second section, the focus shifts towards the nature of collaboration as a process and identifying key insights from literature regarding important elements and phases, and factors which are important influences on the impacts and overall success

of collaborative initiatives and arrangements. In the third section, some of the insights from the literature are used to examine two case studies of collaborative resource management, one from the UK and one from Canada. The chapter concludes by highlighting key lessons from the combination of literature and case studies, and by considering potential future implications for policy makers, resource managers and scholars interested in improving understanding of collaborative approaches, and developing and applying effective practical approaches.

Definitions, benefits and costs of collaboration

The term 'collaboration' is derived from the Latin words *com* and *laborare*, and at a basic level means 'to work together'. While a useful starting point, such a broad definition includes an infinite number of possibilities, and does not provide sufficient conceptual clarity to differentiate collaboration from other common forms of work-related interaction such as, for example, consultation, co-operation, or co-ordination. A related challenge is that collaboration has tended to be defined and examined within specific contexts, such as planning (for example, Booher and Innes, 2002; Frame et al. 2004), governance (for example, Ansell and Gash, 2007; Vangen et al., 2015), or management (for example, Conley and Moote, 2003; Bidwell and Ryan, 2006; Bonnell and Koontz, 2007). As a result, explicit operational definitions of collaboration *per se* are often absent, and therefore it is not always clear whether research findings are directly attributable to the nature of the collaborative process and associated arrangements under investigation, or perhaps to other factors or variables related to the planning, governance or management context.

Of the literature that does provide an explicit definition of collaboration, the work of Barbara Gray, Professor of Organisational Behaviour at Pennsylvania State University, is among the most widely cited (Gray, 1985; 1989). Gray (1985: 912) defined collaboration as:

“(1) The pooling of appreciations and/or tangible resources, e.g., information, money, labor, etc., (2) by two or more stakeholders, (3) to solve a set of problems which neither can solve individually.”

Building on her original definition, Barbara Gray (1989:5) later described collaboration as a process “through which parties who see different aspects of a problem can constructively explore their

differences and search for solutions that go beyond their own limited view of what is possible.” Thompson and Perry (2006: 23) provided a further definition highlighting the need for participants to create means to enable their own interactions:

“Collaboration is a process in which autonomous actors interact through formal and informal negotiation, jointly creating rules and structures governing their relationships and ways to act or decide on the issues that brought them together; it is a process involving shared norms and mutually beneficial interactions.”

Potential benefits arising from collaboration have been described in a variety of ways. For example, Hudson et al. (1999) define collaborative capacity as the level of activity or degree of change a collaborative relationship can sustain without any partner losing a sense of security in the relationship. Sense of security includes the tangible resources which are central to the collaborative endeavour, and the autonomy and relative strength of the individual actors. Huxham (1996) described ‘collaborative advantage’ as a synergy among organizations when something unusually creative is produced that no organization could have produced on its own and when each organization, through the collaboration, can better achieve its own objectives than it otherwise could by acting alone. In contrast, Booher and Innes (2002: 225) refer to ‘network power’ as an important outcome and benefit of collaboration:

“Network power emerges from communication and collaboration among individuals, public and private agencies, and businesses in society. Network power emerges as diverse participants in a network focus on a common task and develop shared meanings and common heuristics that guide their action. The power grows as these players identify and build their interdependencies to create new potential. In the process, innovations and novel responses to environmental stresses can emerge. These innovations in turn make possible adaptive change and constructive joint action.”

Evaluations of collaboration in the environmental domain have pointed to these kinds of benefits. For instance, after evaluating resource planning in British Columbia, Frame et al. (2004), concluded that collaboration was an effective means of resolving environmental conflict, and that collaboration produced significant additional benefits such as improved stakeholder relations, skills and knowledge. Van Tol Smit, et al. (2015) highlighted practical ways in which collaboration allows for diverse types of

knowledge to be brought together. Importantly, however, people almost never collaborate to improve stakeholder knowledge, relations and skills. Instead, they collaborate to address shared environmental problems. Evidence that collaboration produces better environmental outcomes than other governance modes is actually rare, in part because of three challenges Koontz and Thomas (2006) revealed: 1) gathering data that measures environmental outcomes rather than only outputs, 2) allowing for long time horizons between the implementation of collaborative outputs and environmental change outcomes, and 3) designing research protocols that untangle the effects of multiple interacting variables that shape environmental change. Thus, studies such as the one reported by Scott (2015) are important. In a study of collaborative governance and environmental quality in 357 watersheds, Scott (2015) found evidence of positive impacts on water chemistry and in-stream habitat conditions, particularly where groups were engaged in management activities rather than collaborative planning or policy making.

Practical evaluations of the benefits of collaboration are necessary, but in our view not sufficient. Collaborative processes frequently are created in situations where more established governance mechanisms have failed (Watson et al., 2009; Watson, 2015). As a result, the people designing collaborative processes – or simply falling into collaboration – may give insufficient attention to basic concerns such as legitimacy, accountability and fairness. We are far from the first people to raise these kinds of concerns. To illustrate, McClosky (2000) challenged many of the basic assumptions common in the collaboration literature relating to fairness, quality of decisions, and the legitimacy of the processes. Similarly, Bryan (2004) noted that critics of collaborative approaches to natural resources argue that decision-making processes that devolve government authority, hand responsibility for management to unauthorised groups, ignore or circumvent existing laws and regulations and/or preclude the rights of citizens to participate through administrative channels, should be avoided. Proponents of collaboration argue that such problems and limitations can be avoided by giving careful attention to process design and understanding the various factors and conditions which are likely to promote effective, equitable and efficient collaborative decision-making. However, the extent to which good process design can mitigate power imbalances among the actors engaged in collaboration is poorly understood in the field. In a systematic review of collaboration literature linked to water governance, Brisbois and de Loë (2015) found that power was generally ignored and usually poorly

theorized when it was acknowledged. We explore these kinds of concern in more detail in the next section.

Understanding collaboration as a process

Most authors concur that collaboration is a deeper and more richly-joined process compared to co-operation or co-ordination, and that the collaborations most often involves several iterative cycles of decision-making, each of which is likely to include a series of recognisable stages or phases. Building on the earlier work of McCann (1983) and Gray (1985; 1989), Watson (2004) proposed a process-based conceptual model for collaboration to describe how participants engage in an iterative cycle of problem-setting, direction-setting, structuring and producing outputs and outcomes. Throughout the cycle or cycles, participants can be expected to continually evaluate the benefits and cost arising from the collaboration in order to determine whether to increase, maintain or reduce their future level of commitment to the joint venture.

In a different approach, Ansell and Gash (2007) developed a model of collaborative governance which drew attention to starting conditions, institutional design, facilitative leadership, and a collaborative process that included five key variables: commitment, shared understanding, intermediate outcomes, face-to-face dialogue, and trust-building, all of which contribute to the generation of outcomes. Ring and Van de Ven (1994) similarly characterised collaboration as cyclical and iterative rather than a linear process, and drew attention to the relationships among negotiation, commitment and implementation and the idea that participants make on-going assessments to determine whether collective actions are executed in a reciprocal fashion and whether to expand their commitments, seek corrective measures or reduce their involvement. Thompson and Perry (2006) noted that collaboration may be driven by self-interest (termed 'classic liberalism') or commitment to collective needs and shared preferences (termed 'civic republicanism'), and highlight five key elements for a collaborative process: governance, administration, organizational autonomy, mutuality, and norms of trust and reciprocity.

There is also discussion in the literature regarding key conditions and factors which are likely to encourage successful and resilient collaboration. For example, Leverque et al. (2017) found that collaboration related to the conservation of vernal (i.e., temporary) water pools had worked well where

power had become distributed among members, trust had formed across core interests, and social learning had resulted in shared understanding and joint solutions. In addition, agreement regarding rules for group membership, organisational and social norms of inclusion and openness, and the use of small working groups had contributed to the observed patterns of power, trust and learning. Referring to experiences of collaboration regarding social work, Perrault et al. (2011) identified four success factors: attention to informal connections and member relationships; developing trust, respect and understanding; having learning as a purpose; and sharing leadership. Vangen et al. (2015) argued that all collaborations require effective governance, and make a distinction between 'collaborative governance' and 'governing collaboration'. Three key design elements were identified for effective governance of collaboration: 1) structure – providing connections among the participating individuals and organisations and links with other collaborative groups; 2) processes – enabling communication, sharing and decision making; and 3) actors – ensuring the involvement of actors with power and sufficient knowledge to influence and enact the collaborative agenda and agreement.

Various dimensions related to power and power relations have been noted in the literature as particularly important influences on collaboration. In their discussion of network power, Booher and Innes (2002) introduced the acronym 'DIAD' to highlight the need for diversity, interdependence and authentic dialogue. Booher and Innes suggested that authentic dialogue enables all agents to speak in an open and informed way about their interests and understandings and ensures that all are listened to and taken seriously by other participants. Without such dialogue, it is suggested that understandings and meanings will not become truly shared, members will not identify with a common system or community, opportunities for reciprocity will be missed, important information about the problem will not surface and creative solutions are much less likely to emerge. Referring to water governance, Brisbois and de Loë (2015) drew attention to three key forms of power which are likely to be important in many collaborative situations. First, instrumental power is overt and involves the use of resources to influence policy outcomes in competition with others. Second, structural power involves the ability to shape policy agendas and to privilege dominant views or preferences over those of more marginalised groups. Third, discursive power represents the ability to manipulate the wants and desires of others. A key point to emerge from this discussion is that the phenomena of power is more complex than is often appreciated,

and that providing broad and balanced representation at the decision-making table alone is unlikely to be sufficient to ensure effective collaboration and equitable decisions.

In summary, organisations and groups choose to collaborate in order to deal with overlapping interests and responsibilities, and to enhance their problem-solving capabilities. Regarding natural resources and the environment, collaboration is an increasingly preferred approach, particularly in complex and cross-scale institutional settings characterised by multiple public and private sector actors with inter-dependent needs, and also limited individual authority and power to act. A defining feature and key quality associated with collaboration is that typically participants give up some of their independence and make joint decisions in pursuit of a mutually identified and agreed super-ordinate goals or objectives. As such, collaborative relationships are different to co-operative relationships and inter-organisational arrangements based on co-ordination, where levels of interaction are likely to be lower, participants act more autonomously, and attention tends to be focused towards the achievement of the separate rather than joint objectives.

In the literature, collaboration is described as an iterative and dynamic process in which participants engage in learning and negotiation in order to develop shared understandings of their situation and the problems or challenges they face. Assuming that agreement on such matters is reached, the process may then lead to joint commitments, formal and informal agreements, policies, plans and actions. To achieve any of this, most collaborative groups are likely to need their own governance arrangements to address matters such as representation and membership, decision rules, finances, monitoring and reporting, and accountability. Furthermore, collaboration may occur in relation to governance, planning or management, and also combined initiatives involving different regimes and functions in more complex cross-scale collaborative arrangements. Because collaboration depends on mutual agreement, there are no fixed rules other than those developed by the participants and, because emphasis is often placed on learning, collaborative arrangements can be expected to evolve over time. In this regard, collaborators are likely to continually re-evaluate the benefits and costs of their participation and consequently increase, maintain or decrease their involvement as the collaborative process develops and unfolds.

Given the often complex, dynamic or even 'messy' nature of collaboration, it is not at all surprising that authors and commentators have generally avoided detailed prescriptions, protocols and exact models. Nevertheless, previous research does suggest that, for collaborative initiatives and arrangements to be effective and enduring, particular attention should be given to: 1) antecedents and motives; 2) power and power relations 3) dialogue and trust; 4) inter-dependency and reciprocity; and 5) outputs and outcomes. These matters are further explored in the following section, where attention is turned to learning from experiences regarding two examples where a collaborative approach has developed to address concerns and problems related to land and water resources.

Learning from experience

Case study 1: collaborative catchment management in the UK

Loweswater is a small lake of around 0.6 km² with a surrounding upland catchment area of 7.6 km² in the county of Cumbria, North West England. Situated in an isolated area designated as a 'quiet valley' by the Lake District National Park Authority (LDNPA), Loweswater contrasts sharply with the other larger iconic lakes in the region, such as Windermere and Coniston which attract hundreds of thousands of visitors each year. The lake at Loweswater is owned by the National Trust (NT), which is a charitable and membership-based conservation organisation established in 1895. The surrounding lowland pasture and upland fells are incorporated within eight separate land-holdings, each farmed by tenants for sheep and cattle production. Land within the catchment has low agricultural potential due to the landscape and climate, and additional inputs of organic and inorganic nutrients are needed to maintain the pastures and to produce sufficient animal feedstocks for the winter. There are around fifty permanent residents in the catchment area, including retirees, small business owners who provide camping facilities, rental cottages and hotel accommodation for visitors, and around ten farming families. During the summer months, many thousands of people pass through and stay in the area while visiting the Lake District. In addition to the LDNPA and NT, other organisations with interests in Loweswater include the Environment Agency (EA) which has statutory responsibilities for pollution control and river basin management, and Natural England (NE) which administers many of the voluntary and payment-based environmental improvement schemes available to farmers in selected areas.

Antecedents and motives: deteriorating water quality at Loweswater first began to attract local concern in the 1990s as a result of increased prevalence of blue-green algal blooms, particularly during

the colder winter months when such problems would not usually be expected. The NT posted signs around the perimeter of the lake warning of the dangers to people and animals of coming into contact with potentially toxic cyanobacteria. Despite the controversy and increased local concern, little if any action was taken until 2000 when the EU Water Framework Directive was adopted in England and Wales and responsibility for implementation as handed to the EA. Initial assessments by the EA indicated that Loweswater was unlikely to meet the requirements for 'Good Status' and notices were issued to several local farmers warning of the possibility of prosecution if they were found to be causing or contributing to the problem. Relations among the farmers, local residents, and staff from the EA, NT and NE became increasingly strained. Members of the farming community believed they were being blamed for a problem that they had not necessarily caused and were anxious to avoid costly legal proceedings and stricter regulations regarding land use and management. Similarly, as the owner of the lake, the NT wanted to improve relationships with the local community. Meanwhile, the EA was facing reductions in finances and was increasingly interested in locally-led, voluntary approaches rather than expensive regulatory action.

Keen to show that the problem was being taken seriously, in 2002 the local farming community established a ten-member Loweswater Improvement Group (LIP) to enhance practical understanding and strengthen relationships with the various agencies. Next, in 2003/04, the NT and NE jointly funded research by the Centre for Ecology and Hydrology (CEH) to test soil samples and investigate the impacts of farming practices on the lake. Around the same time, a number of local property owners took the step of installing new septic tanks to deal with human waste and some of the farmers invested in new slurry stores and drainage systems to separate clean rain water from dirty yard water.

Despite improved relationships and some positive action, there were still many uncertainties and different opinions regarding the causes of the algal blooms on the lake, possible links to past and present farming methods and other nutrient sources, and ways to effectively mitigate the problem. Recognising the opportunity, and with the agreement of local farmers and agencies, researchers from CEH and Lancaster University proposed a project to enable a diverse range of actors to collaborate in conducting new research to improve understanding and management of the catchment. Funding for the

three-year project was awarded through the joint UK Research Council (RCUK) Rural Economy and Land Use Programme (RELU) in 2007.

Power and power relations: given the diverse range of actors involved with Loweswater, and also the history of weak organisational relationships and acrimony regarding the lake, a key challenge was to ensure that particular groups or interests would not dominate and therefore undermine the collaborative process. To address this concern, Latour and Weible's (2005) concept of a 'knowledge collective' was applied to create an open forum which served as a social, community-based, mechanism to bring people together to exchange information, explore and evaluate different claims and beliefs regarding the catchment and, where possible, develop shared understandings of the situation. The knowledge collective was named by the group as the Loweswater Care Project (LCP) and, to ensure as much as possible that individual groups or people did not try to dominate or control the process, five guiding principles were adopted:

- 1) There is not a single correct or self-evident way of understanding or explaining the environment.
- 2) All forms of knowledge and expertise need to be debated.
- 3) Uncertainties regarding knowledge and understanding should be recognised.
- 4) Making new connections among organisations, system variables and processes and bodies of knowledge is valuable.
- 5) Doubt and questioning should be applied to claims and arguments from all fields, including science and politics.

The five principles were applied through a series of fifteen open-forum meetings held every two to three months in the village hall at Loweswater over three years. Each meeting was held in the evening to enable as many people as possible to attend, lasting for between three and four hours and attracting 25-35 people. The format worked well, and the meetings were attended by a diverse mix of people from inside and beyond the catchment area, including representatives for the EA, LDNPA, NE and NT, farmers and local business owners, residents and social and natural scientists from CEH and Lancaster University. Three particular factors appeared to help ensure the LCP was reasonably effective in dealing

with power and power relations: holding meetings in the community, rather than in agency premises; carefully following principles designed to encourage open debate; and focusing explicitly on knowledge production rather than management decision making, which helped to lower the stakes and reduce the risks for the participants. Nevertheless, the LCP was not an entirely effective mechanism. For example, some residents, farmers, organisations and groups did not attend at all, and some of the people who did participate remained uncomfortable with being part of a collective and would have preferred a more conventional committee-style structure and process.

Dialogue and trust: a number of design elements were included in the collaborative project to promote dialogue and build trust. Prior to the start in 2007, researchers from CEH and Lancaster University had gradually developed strong relationships with some of the local farmers and had provided technical input and support to the predecessor LIP group since 2003/04. In addition, researchers undertook an initial scoping study to gauge potential interest and gather support, before preparing a proposal for a full-scale project. Subsequently, one of the researchers spent several days visiting and interviewing local people, in part to gather background information but also to build inter-personal relationships. The first few meetings of the LCP were used to explain the particular approach to collaboration that the researchers were recommending, to establish aims for the group and to agree the procedures to be followed.

To encourage open and inclusive dialogue during the meetings, a range of relevant topics were identified for discussion, and over the three-year period the LCP examined and debated diverse matters including local cultural and economic history, past and current farming practices, recreational fishing on the lake, tourism, domestic waste and septic tanks, catchment hydrology and geomorphology, and institutional arrangements related to the governance and management of land and water in the catchment. In addition to measures intended to encourage open dialogue, a number of other elements were introduced to develop trust among the participants. For example, a widely respected and trusted local farmer was hired as a part-time researcher to help with communication, facilitate access to land for research, and act as an intermediary. In another effort to promote trust, an LCP meeting was organised at which representatives for all of the key agencies gave presentations and answered questions from the participants regarding statutory responsibilities and powers, policies, resources and

capabilities with regards to the catchment and lake. Nevertheless, there were inevitable disagreements and heated exchanges at some of the gatherings, some participants stopped attending after the first year, and the farmers were often reluctant to disclose details in public and also held several of their own meetings outside of the LCP forum.

Inter-dependency and reciprocity: according to advice in the literature, one of the keys to collaboration is to create a strong sense of inter-dependence and similarly strong reciprocal relationships among the participants. In the Loweswater project, one of the guiding principles concerned the importance and value of making new connections. However, in practice, finding agreement on relevant systems, boundaries and knowledge proved to be one of the most difficult challenges and the issue was still not resolved at the end of the three year period. To illustrate, some participants viewed the blue-green algae as a complex problem in its own right, and believed that the LCP needed to focus on developing a detailed understanding of lake nutrient cycles and ecological processes in order to eradicate or at least reduce algal blooms on the lake. In contrast, other participants regarded the algae to be a symptom of a much larger problem regarding the functioning of the catchment area, including the management and drainage of land for farming, other business purposes, and conservation. To a degree, the inter-play among the different views and preferences was an important feature of the collaborative and iterative processes and, in general, participants were willing to compromise and accept there are multiple ways of framing resource-related problems. One particular innovation which proved to be useful for handling such differences related to the funding awarded by RCUK. The research grant included an additional budget of £35,000 for initially unspecified expenditure to enable the LCP to commission additional research on important matters that might arise during the project. The flexibility around some of the funding enabled members of the LCP to suggest additional research and therefore accommodate a range of different priorities and interests. Two small-scale studies, one on attitudes to tourism and the other on the use of septic tanks, were subsequently carried out by LCP members from the local community. Three additional pieces of research, on land use change and lake sediments, phosphorous applications on farmland and flows to the lake, and macro-scale water movements in the catchment were conducted by local people working with some of the scientists from the project. As such, attempts were made to establish two-way reciprocal relationships among scientists and lay people and to avoid situations where scientists were perceived to be the only

experts. While these kinds of approaches and strategies were positively received by the LCP at the time, it is also true that some members felt disillusioned and were disappointed at the end of the three year project because answers for the specific problem of blue green algae in the lake had not been found.

Outputs and outcomes: given the often considerable additional time, effort and resources required for collaborative initiatives, it is entirely reasonable that questions arise regarding the impacts relative to other approaches potentially available to organisations and groups. In attempting to evaluate the impacts and benefits of collaboration at Loweswater, it is important to keep in mind that the funding awarded by RCUK and the subsequent work was aimed at improving knowledge and understanding and did not include financial resources for changes or improvements to the management of land and water in the catchment. Nevertheless, it was hoped that practical action might occur as a consequence of new information and evidence generated from the LCP and the associated collaborative research.

Prior to the project, one of the main challenges related to Loweswater concerned the small size of the lake and surrounding catchment, which meant that the area was not a high priority for government and public agencies with the ability to support improvements in management. However, the LCP helped to draw attention from policy makers at a time when national interest in catchment management and community-based action was increasing. The LCP provided legitimacy for management of the catchment which had previously been lacking, and the various technical reports produced during the project provided credible fresh evidence indicating that changes to land use and farm management could have positive impacts on lake water quality and help to reduce the incidence of algal blooms.

By the end of 2010, many of the local and agency-based LCP participants were keen for the initiative to evolve to a new phase where practical action could be taken. However, the researchers from CEH and Lancaster University felt it was not appropriate for them to lead a new phase, given the RCUK funding had ended and that attention was starting to move more towards catchment management and away from research and knowledge production. As a result, two members of the Loweswater community acted on behalf of the LCP and applied for new funding under the England Catchment Restoration Fund (CRF) and were awarded £275,000 to address the causes and effects of nutrient enrichment of the

lake. Following this success, proposals were created to take the LCP forward without the involvement of CEH or Lancaster University but, unfortunately none of the remaining organisations and groups were willing to accept responsibility or take the lead because of perceived legal difficulties and financial risks. With the collapse of the LCP, an eight-person Management Committee was formed by a small group of local farmers, residents and representatives for the EA, NT and NE in association with an umbrella organisation called the West Cumbria Rivers Trust to administer the CRF grant. Subsequently, the Committee awarded funding to four of the eight farms in the catchment for improvements to animal slurry stores, roofing for farm yards, infrastructure to separate rain water from dirty water, fencing-off land close to streams, stream restoration work, shared farm machinery to reduce soil compaction and improve aeration, new farm buildings outside of the catchment, plus a programme operated by two residents and staff from the NT to monitor lake water quality. Initial monitoring results indicate improvements in water chemistry but less clear changes in algal populations, with some species increasing in numbers while others have declined.

Overall, collaboration has been an important and valuable aspect of the development of catchment management at Loweswater. Collaboration among farmers, residents, conservation organisations, public agencies and researchers has enhanced credibility and legitimacy, produced new evidence and knowledge, and enabled practical action to be taken. However, the LCP did not result in a lasting governance or management transformation, and collaboration appears to have been replaced with more conventional and less inclusive approaches to decision making.

Case study 2: source water protection in Ontario

The Province of Ontario is the most populous of Canada's ten provinces and three territories. Most of its residents (approximately 8 in 10) are served by drinking water treatment and distribution systems that draw their source water from surface and ground sources. The provincial government establishes the regulatory and policy framework under which drinking water provision occurs, while responsibility for operating drinking water treatment and distribution systems lies primarily with municipalities and public utilities (Water Strategy Expert Panel 2005).

The recent history of drinking water provision in Ontario has two main eras: before a waterborne disease outbreak in the Town of Walkerton, Ontario (population 4,800), in May, 2000, and after. The former era

is characterized by widespread complacency about drinking water safety. The regulatory environment had been weakened through a series of changes, budgets had been reduced and technical staff in provincial agencies responsible for monitoring and regulating systems cut back dramatically (Kreutzwiser 1998). Contamination of the water supply of the Town of Walkerton in May, 2000 by *Escherichia coli* O157:H7 and *Campylobacter jejuni*, resulted in seven deaths and over 2,300 cases of illness. In response, on the advice of a wide-ranging public inquiry, the provincial government strengthened the regulatory system and instituted a multi-barrier approach to drinking water safety. Importantly, a key feature of the new, post-Walkerton drinking water system in Ontario is source water protection organized at the watershed (catchment) scale and based on a collaborative planning model. Under the new *Clean Water Act* (Statutes of Ontario 2006, Chapter 22), 19 collaborative bodies organized around watershed boundaries have played a crucial role in developing drinking water source protection plans and the policies that are being implemented at the local level to protect these sources.

Antecedents and motives: The challenge of protecting drinking water sources is universal, and countries around the world have taken different approaches. For instance, in the United States, the federal government created the overarching rules under its *Safe Drinking Water Act*; states and local governments play key roles in actually developing and implementing plans (de Loë and Lukovich 2004). In England, source water protection takes place through a host of legal and policy instruments that are coordinated by government and non-government organizations operating at the national, regional and local levels (Watson, et al. 2009). Ontario has a long history of watershed management through its watershed-based conservation authorities, but has been a relative latecomer to drinking water source protection. In the aftermath of the Walkerton tragedy, the commission of inquiry charged with analysing the causes of the outbreak and then proposing a way forward was presented with numerous ideas and models for how to build a robust system for protecting drinking water sources. In light of the deep cuts to the capacity of the provincial government that had taken place throughout the 1990s, a top-down planning approach would not have been feasible. Fortunately, conservation authorities were ready and willing to play key supporting roles. These locally-created, watershed-based organizations that have existed in Ontario since 1946 covered most of settled southern Ontario, and were well positioned in terms of technical capacity to support a more bottom-up, collaborative approach to source water protection.

The system that exists today illustrates how collaboration can be inserted into a regulatory environment that already includes a host of actors with implementation responsibilities. The *Clean Water Act* established the framework for source water protection. Collaborative source protection committees were formed in each of 19 source protection jurisdictions based on the boundaries of one or more existing conservation authorities. Source protection committees have a chair and members representing municipalities (one-third); agricultural, commercial or industrial interests (one-third); and environmental, health and other sectors, including the general public (one-third). In addition to these members, committees are required to seek members from First Nations (Indigenous) communities located within their area of jurisdiction. Responsibilities and operating procedures for these committees are specified in a provincial regulation made under the *Clean Water Act*. Nonetheless, the committees are meant to function as true collaborative bodies.

Power and power relations: Power takes many forms, including instrumental (the power to force others to do one's will); structural (the power to set agendas); and discursive (the ability to shape social norms and values) (Lukes 2005). Collaboration poses challenges for those interested in the way power is used and distributed in society. Power imbalances within collaborative processes are an obvious area for concern. For instance, industry is crucial to Ontario's economy, and a source of many threats to source waters. Representatives of large industries are members of source protection committees in jurisdictions where these industries operate. It would be naïve to believe that the financial and technical power firms hold, let alone their elite access to decision makers in government, disappears once they participate in a collaborative process. Brisbois and de Loë (2016a) found that large industries were enthusiastic participants in collaborative source protection committees in Ontario, but had a limited commitment to engage in shared learning and to re-examine values and interests (two key benchmarks for successful collaboration). Indeed, firms benefited from participating in these processes through having opportunities to influence other participants and to learn about their perspectives, while still being able to exert influence directly on policy makers through elite-level relationships and lobbying that took place entirely outside of the collaborative processes.

Concerns for power did not exist solely within the collaborative committees. In considering the motives of the provincial government, Brisbois and de Loë (2016b) found that the provincial government exerted considerable power over the collaborative processes from agenda setting through to implementation. As explained previously, the provincial government made the rules. In part this simply reflected the fact that the provincial government is responsible for drinking water safety in Ontario, and thus relied heavily on its traditional command-and-control mechanisms despite creating these collaborative processes. Command-and-control and rigid bureaucratic structures are common characteristics of the state. However, Brisbois and de Loë (2016b) also found that the state used its power over the collaborative processes to protect economic actors; this reflected a concern for jobs and growth that is also widely shared by governments around the world.

Dialogue and trust: Concerns relating to open dialogue and trust among participants flow in multiple directions in the source protection planning process in Ontario. Not only is source water protection a highly technical activity, but also it tends to be extremely political because protecting water usually means changing land use practices. Activities that have been legal and accepted in the past – from spreading manure on fields to fertilize crops, to using salt on roads in winter to protect drivers from accidents – may become unacceptable in some areas due to the needs of source water protection.

Concerns such as these naturally surfaced during the process of plan and policy development. They were especially prominent in the context of farming, and the involvement of the farm sector. As a proportion of the population in Ontario, farmers represent only approximately 2% -- yet they own and manage approximately one third of the land in southern Ontario (OMAFRA, 2012). Farmers in Ontario have long recognized that normal farm practices affect air and water quality. Thus, the sector, with the support of the provincial government, had a history of using voluntary stewardship programs and measures to protect water resources (Armitage 2001). The Walkerton crisis triggered a proscriptive, regulatory approach to source water protection that disregarded “historical practices and shared understandings, especially in rural areas with long agricultural traditions” (Ferreya et al., 2008, 318). Thus, the potential existed for conflict and unproductive relationships on the committees.

Through intensive behind-the-scenes dialogue, consultation and capacity building, a constructive approach to including farmers in source protection planning efforts was developed. A provincial farm sector organization undertook a deliberate program of capacity building to ensure that farmers could participate effectively in the multi-actor source protection committees. The farm sector in general, and individual farmers, then viewed engaging with other source protection committee members and sharing their general and local knowledge about agriculture as key priorities (Simpson and de Loë 2015). Trust developed through processes of knowledge co-production, and through farm participants in the collaborative committees demonstrating the value of agricultural knowledge for the work of source protection planning. In many cases farm representatives were able to challenge technical knowledge provided by specialists supporting the work of the collaborative committees (Simpson and de Loë 2015).

Inter-dependency and reciprocity: Collaboration can be an effective strategy for drinking water source protection because threats to water quality have multiple historical and contemporary sources linked to a vast range of practices and behaviours on the landscape, and because responsibility and authority for dealing with those threats tends to be widely shared. This certainly is the case in Ontario, where threats to drinking water sources identified in Ontario Regulation 385/08 of the *Clean Water Act* include agricultural practices such as manure storage and fertilizer application; routine winter road maintenance activities such as storing snow and handling, storing and applying road salt; industrial practices related to the handling and storage of fuel and organic solvents; and activities that involve taking water without returning it to the source. These activities implicate a host of actors, including farmers, business owners, municipalities, and provincial and federal government agencies. As a result, it is well recognized and accepted in Ontario that planning for source water protection benefits from collaborative approaches where those who are causing the threat and/or responsible for dealing with the threat share knowledge and resources, take account of the impacts of their activities on each other, and mobilize the tools available for dealing with threats to source waters in a coordinated fashion.

In Ontario, recognition of these interdependencies exists not only within each source protection jurisdiction, but also among them. Within each of the 19 source protection jurisdictions, policies to respond to identified threats had to be developed on an extremely tight timeline. Because they are based on watersheds, the boundaries of the regions divide municipalities. Some municipalities are located in multiple regions, and each region contains multiple municipalities. Hence, a shared policy

making challenge existed in each region – with the collaborative source protection committees at the centre. In response to this challenge, Conservation Ontario, the umbrella organization that represents the conservation authorities that provide core technical support for source protection planning, partnered with the Ontario Ministry of the Environment, which is responsible for source protection planning. They developed several tools designed to speed up the policy making process: a catalogue of existing work; a policy web forum; and a policy database (de Loë, et al. 2016). Policy planners in the 19 regions used these tools to facilitate rapid, concurrent policy development that supported the work of the collaborative source protection committees. The ability to “reuse” or share policies developed for one of the source protection jurisdictions in another was variable, and most successful in cases where the challenge was not generic and not defined by extremely local circumstances or contexts (e.g., policies relating to the development of signage); in contrast, policies for taking water without returning it to the same aquifer were more difficult to share – yet sharing did occur among neighbouring source protection jurisdictions (de Loë, et al. 2016).

Outputs and outcomes: Ensuring that clear and relevant outputs and outcomes emerge from a collaborative process is a central challenge. In collaborations that form entirely through bottom-up processes, benchmarks for success in terms of outputs and outcomes can be unclear. In the case of Ontario’s source protection committees, outputs and outcomes were, for the most part, clear and measurable. Under the *Clean Water Act*, the committees were required to lead the characterization of water resources, including the creation of water budgets; the delineation of vulnerable areas; and the identification of threats to drinking water. With this foundational work complete, they were required to create source protection plans and related policies that use a range of tools to protecting source waters in vulnerable areas. Outputs were thus tangible products such as water budgets, source protection plans, and policies. Much of the actual work of developing these complex products was undertaken by staff from conservation authorities, municipalities, and consulting firms. Nonetheless, the collaborative source protection committees played a crucial steering role. As of the time this chapter was written, in mid-2017, source protection plans had been completed and approved for all 19 regions, and implementation was underway.

Important outcomes from the collaborative approach to source water protection that has been established in Ontario are already evident. First and foremost, while no comprehensive assessment has yet been completed, few would disagree that Ontario's drinking water sources are better protected in 2017 than they were in 2000. An enormous effort has been made to improve understanding of water resources, especially groundwater systems, and to identify threats and vulnerable areas. Many people and organizations in conservation authorities, municipalities, universities and other organizations were involved, but the collaborative source protection committees played an important leadership role in ensuring this work was completed. A less tangible, but by no means insignificant, outcome of the collaborative process used is the strengthened networks and relationships that have developed not only within the source protection regions, but among them, and among the diverse actors who play a role in ensuring that sources of drinking water in Ontario are protected from contamination.

Lessons and implications

Review of literature and exploration of two experiences in the UK and Canada provides some useful insights regarding circumstances in which collaborations tend to emerge, how they develop, their benefits and costs, and factors which seem to affect performance and success. Critically examining experiences related to the management of a small catchment area and the protection of source water has revealed some valuable lessons, which have implications for organisations and individuals attempting to collaborate, or perhaps considering collaboration as a possible future approach.

Below, we draw attention to six key lessons which have emerged from our analysis, and comment on some of the potential implications for policy and practice.

First, collaboration is clearly not a panacea for all resource-related problems or management situations. . Public, private and third-sector organisations and groups often have clear legal rights and responsibilities which cannot be ignored or over-ridden. When existing rights and responsibilities are not fully understood and acknowledged, and therefore potentially under threat, it is unlikely that a collaborative initiative will even get off the ground. This implies that one of the first steps in considering the potential for collaboration should be a careful analysis of existing institutional arrangements to

identify areas where there is genuine inter-dependency and scope for reciprocal, mutually beneficial relationships.

Second, as shown by both cases studies, collaboration does not happen overnight, and often emerges from a lengthy period of interaction and discussion among actors and stakeholders. This may also involve failed attempts by individual organisations or smaller groups of actors to solve problems, eventually leading them to realise that collaboration may be necessary. Collaboration cannot be forced. Judgements need to be made regarding whether conditions are favourable and the time is right to propose collaboration as a way forward. Even in cases where the collaborative process is formed in a top-down manner, as occurred in the case of source water protection in Ontario, participation ultimately is voluntary.

Third, collaboration requires credible, trusted leadership in order to work well. In the case of Loweswater, this came from university academics with established relationships in the area. In Ontario, leadership originated from multiple directions, including the provincial government, which established the framework and provided substantial resources to support foundational technical work; the conservation authorities, that provided technical support; and the various organizations that provided support in other ways. The active capacity building support provided by farm sector organizations to the farmers who served on the collaborative committees in Ontario is a striking example of the importance of informal or unofficial leadership.

Fourth, scepticism is often associated with collaboration and collaborative initiatives. Not only is such scepticism or wariness warranted, but can also be constructive. It has long been argued by some that collaboration can be used inappropriately by governments to share the burden of work, without adjusting the balance of power and authority, or simply to create the appearance of action. Especially in situations where collaborative processes are situated in an already complex institutional landscape – which described virtually every water-related example – great care is needed to integrate collaboration and the outputs of collaborative processes into existing governance systems. Collaboration needs to be based on a clear and explicit power-sharing arrangement that are seen to be fair, and are accepted by the participants. At the same time, it is crucial that participants understand that collaboration cannot

erase power differentials, and indeed that some parties engaged in collaboration have considerably more power than others (and can draw on that power to effect the changes they desire outside of the collaborative process).

Fifth, collaboration should not be entered into lightly. A commitment to long-term effort is required. Collaborations are easily de-railed, and require heavy organisational investment to ensure collective understanding of the problem, to allow for dialogue, and to permit learning. A clear vision and clear goals are essential. In the context of water-related collaborations, governments that support collaborations (whether bottom-up examples or ones they themselves have formed) must be consistent in their support and clear about their purpose.

Finally, collaboration can generate a range of benefits related to knowledge sharing, joint learning, trust, and conflict resolution. However, these in themselves are largely incidental benefits, and experience suggests the primary motive is often the desire or need to improve resource and environmental conditions. This reinforces the fact that collaborations work best when there is a clear, shared understanding of the mutual problems faced by the participants. In the absence of a shared problem that cannot be effectively addressed by participants acting alone, collaborations are unlikely to be able to maintain their momentum, and will falter.

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