



Guest Editorial, part of a Special Feature on [Collaboration and conflicts in complex water governance systems across a development gradient](#)

## Collaboration and conflict in complex water governance systems across a development gradient: addressing common challenges and solutions

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### INTRODUCTION

Water is inextricably woven into all facets of human society, from agriculture and industry, to household use, and ecosystem services. It is precisely the universal role water plays in sustaining the functioning of local to global social-ecological systems that makes the governance of this resource an enduring challenge, and one that is manifest across diverse sociopolitical and biophysical contexts (Conca 2006). The articles in this special issue collectively highlight three interrelated challenges water governance systems must address to be effective and sustainable: (1) the multiscale and boundary-spanning features of water do not, in general, adhere to human-defined political boundaries; (2) the diffusion of administrative responsibilities that follows from such human-defined boundaries creates complex institutional arrangements that are often at the center of multifaceted conflicts over water resources; and (3) the intersection of multiple water uses may be difficult to reconcile because some uses are mutually exclusive.

In the academic literature, numerous studies have emphasized the need for systemic governance approaches that are aligned with the geo-hydro-ecological processes that create and maintain the provision of water in its various forms (Folke et al. 2007, Lebel et al. 2013, Sayles and Baggio 2017). Integrated water resources management (IWRM) is one such approach that has received considerable attention over the past few decades for catalyzing wholesale changes in the process of water management decision making in many countries around the world (Pahl-Wostl et al. 2011, Schoeman et al. 2014). Integrated water resources management emphasizes the need for a watershed perspective; the drainage basin constitutes the fundamental management unit and the basin council forms the core of the overarching institutional structure and is charged with making management decisions that align with biophysical characteristics of the basin. Improving the alignment of biophysical and sociopolitical structures and processes is, in general, presumed to enable more holistic governance of shared biophysical resources, yet these efforts have not always been borne out smoothly in practice (Christensen et al. 1996, Guerrero et al. 2015). Integrated water resources management has received criticism for providing little practical guidance for implementation and for not demonstrating improved outcomes, and is by no means the only approach to water governance that aims to synchronize human and natural systems (Molle 2009, Lubell and Edelenbos 2013).

A common thread across efforts to transform water governance in ways that reconcile institutional structures with hydrological realities is participation and collaboration. The participation of diverse public and private actors is assumed to be necessary in collaborative decision-making processes on account of the multiscale and boundary-spanning features of water resources

(Bodin 2017). Collaboration in environmental governance has been studied from a variety of perspectives and is frequently discussed as a normative concept in both research and practice, i.e., we “want” collaboration because we think it is “good.” However, collaboration can lead to the establishment of coalitions of like-minded individuals and organizations, often at the expense of collaboration across coalitions (Weible 2007, Henry et al. 2011). Hence, the aim to bridge across the social, political, and sectoral boundaries that typically characterize water resources may not necessarily be fulfilled through participation and collaboration alone. Furthermore, strengthening collaboration among actors who share the same views may also potentially reinforce pre-existing conflicts. However, somewhat paradoxically, conflict can also be an important driver of collaboration (Boelens et al. 2018, Koebele 2019). Studies that address collaboration jointly with conflict are the exception, not the rule, in spite of the fact these two phenomena are very much interdependent.

This special issue brings together a diverse set of articles that collectively address many of these issues and which do so across an expansive development gradient using empirical cases from the global South and North. Challenges to the governance of shared water resources are not endemic to a particular region, political system, or economic interests and may share common causes and solutions. The articles in this special issue adopt different research perspectives, and many pay particular attention to the social networks established between actors involved in the governance of water resources. For this reason, social network analysis is at the heart of several of the articles presented and has the added benefit of providing a common analytical framing for comparison across contexts (Lubell et al. 2012). Network approaches are also being increasingly used to investigate the intertwined structure of both sociopolitical and eco-hydrological systems (Bodin 2017, Bodin et al. 2019), and one article explicitly applied a social-ecological network perspective.

### MULTISCALE AND BOUNDARY-SPANNING GOVERNANCE CHALLENGES

As a mobile resource, it is not uncommon for water to cross multiple political and administrative boundaries, and multiple administrative levels (e.g., local, regional). Several articles in this special issue address the multiscale and boundary-spanning nature of water resources, and do so across a wide range of empirical contexts.

Widmer et al. (2019) applied a network approach to highlight the often invisible, yet very direct, connectivity among upstream and downstream water users through the case of micropollutant management in the Rhine River basin. Micropollutants include thousands of different chemical compounds stemming from

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diverse sources and pose challenges for understanding the spatial extent of environmental impacts, as well as determining the appropriate management scale. The authors assessed three different networks: a social network of actors who collaborate in water quality management, an ecological network of the river catchments, and a social-ecological network of actors connected to the catchments through competences and action. The findings indicate that even though there is a tendency for two actors to collaborate when they use or manage the same water resource, the general absence of collaboration between actors is more common overall. This kind of social-ecological “misfit” is a common challenge in transboundary and multilevel resource management settings.

Berardo et al. (2019) also used social network analysis to provide insight into the structures of collaboration among actors in multilevel water governance arrangements. The authors investigated the network of formal coordination among public and private actors for managing nitrogen and phosphorus pollution in the Maumee River watershed in the United States. They discussed how certain coordination structures, among actors working at certain administrative and geographic levels (e.g., county, state, watershed), may lead to more effective management of nonpoint source pollution in this multistate institutional arrangement.

By drawing on experiences from Brazil, Peru, El Salvador, Nicaragua, Sweden, and the U.S. to pinpoint the gap between municipalities (i.e., local governments) and basin governance institutions as an especially problematic challenge in practice, Mancilla García et al. (2019) further contribute to the discussion of connectivity and multiple scales in water governance arrangements. In their insight article, the authors discussed how management decisions taken by municipalities both affect, and are affected by, stakeholders outside their municipal jurisdictions; yet, integrating municipalities within basin councils is neither a simple nor straightforward process.

Although most of the articles deal with the difficulties of cross-scale collaboration, two articles also included a discussion of challenges to collaboration within scales. Fischer et al. (2019) investigated how different institutional histories affect the types of governance networks observed in the sanitation sector in two Vietnamese regions: the urban metropolis of Hanoi and the more rural province of Ben Tre. In Hanoi, local level actors have direct access to national level organizations, as well as donor organizations and other international actors, who typically promote horizontal forms of governance. In contrast, in Ben Tre the traditionally hierarchical political structures of socialist states are still very much in use. Berardo et al. (2019) similarly discussed the importance of horizontal coordination among actors within, and across, state jurisdictions in the U.S. Although the authors find evidence of horizontal coordination, this particular type of collaboration occurs primarily within individual state jurisdictions.

#### **DIFFUSE ADMINISTRATIVE RESPONSIBILITIES: INSTITUTIONAL CHALLENGES AND MULTIFACETED CONFLICTS**

The complexity of water governance emerges from the multiscale and boundary-spanning features of water resources, which can bring together a diversity of water users and other stakeholder groups across a wide geographic area. Although tension is not

uncommon when deliberating the allocation of water and other environmental resources, the intersection of multiple administrative jurisdictions along the same body of water can exacerbate conflicts over competing water uses. Furthermore, the root causes of water resource conflicts tend to be multifaceted; rarely are they easy to distill into a singular problem, or to resolve through a singular management action (Böhmelet et al. 2014, Hileman et al. 2016). The fundamental role water resources play in supporting human societal development and ecosystem health all but ensures management dilemmas will span multiple policy issues and often multiple policy domains.

Berardo et al. (2019) investigated the challenges posed by diffuse administrative responsibilities for addressing nonpoint source pollution. The increase in seasonal harmful algae blooms in Lake Erie, an important source of public drinking water supply, is in part driven by the use of nutrient-laden fertilizers within the largely agricultural Maumee River watershed. Although nutrient pollution from any individual farm may be small, the sum total of all fertilizer runoff from farms in the watershed has pronounced water quality implications. A key governance challenge in this case is coordinating an institutional response that addresses a range of agricultural management practices and reconciles competing water uses across a mosaic of overlapping territorial jurisdictions spanning three U.S. states and over a dozen counties.

Damonte (2019) focused on institutional challenges and conflict over the quantity of available water, specifically in the context of aquifer overdraft, in an agricultural region of Peru. He articulates the role a powerful agri-business coalition along the Peruvian coast has played in the overexploitation of groundwater from the aquifer, which has led to acute physical water scarcity. The rapidly depleting aquifer has created conflict among the agri-business elite and environmental protection agencies, however, the agri-business coalition is supported by other influential state actors, such as the Ministry of Economy. The coalition has been successful in preserving its interest in continuing to exploit the aquifer, in part because of the contradictory policies that different state actors have adopted in response to different sectors and interest groups. The coalition has further benefited from the high turnover and weak organization of public officials, who have been unable to introduce environmental considerations into water policy at the state level.

Public actors typically hold and defend multiple, and at times contradictory, interests, as Mancilla García et al. (2019) illustrated in their article on the role of municipalities in basin governance arrangements. Municipalities must simultaneously manage a range of interests because of their varied administrative competencies, such as urban planning and infrastructure development, and status as public service providers. For example, on the Swedish island of Gotland, the municipal government struggled with the dilemma of seeking balance between economic development through expanded mining activities and safeguarding the quality of municipal water supply sources.

Through their comparative analysis of sanitation management in Vietnam, Fischer et al. (2019) illustrated how governance structures have, or have not, responded to policy changes in the sector. The authors discuss how socioeconomic and educational factors may help explain the observed differences in governance

structures between Hanoi and Ben Tre, as well as their implications for sanitation management in a setting in which the national government is seeking to decentralize administrative responsibilities while maintaining control over policy and investment.

Along with Fischer et al. (2019), Cisneros (2019) also highlighted how context is key in determining the outcomes of collaborative processes, particularly in developing countries. In Cisneros' case, the influence of national regulatory authorities over rural watershed councils in Ecuador was illustrated through policy changes that were implemented in 2015. Specifically, the state revised the structure of stakeholder participation in the watershed councils by requiring participants be organized water users (e.g., local water boards, agricultural associations), and thus limiting the participation of previously influential nongovernmental organizations. Through an examination of the Chambo and Machángara watershed councils, Cisneros showed how the structures of collaboration among council members were impacted by this change in policy, including the defection of members from one of the councils. Although such policy changes can deepen structural inequalities by making it more difficult for different stakeholders to collaborate, the study further demonstrates how the effects of policy changes can be absorbed by more resilient councils, and illuminates a number of factors associated with resilience in this context.

#### **RECONCILING ACTORS' INTERESTS AND PERCEPTIONS AROUND MULTIPLE WATER USES**

Although collaborative forums for water governance have been established around the world, this does not mean actors have equal influence within these forums, or that collaboration necessarily leads to improved policy and management outcomes (Mancilla García and Bodin 2019). Coalitions within collaborative forums may simply reproduce existing power dynamics in society. Regardless, they have not always managed to empower previously excluded interests (Webler et al. 1995, Huitema and Meijerink 2014). However, in the developing world participation has often been introduced as a panacea, or as a condition for funding by international donors without critical analysis of the local social and institutional context required to make participation in collaborative forums meaningful (Cooke and Kothari 2001). In the absence of meaningful participation, actors may adopt different attitudes toward collaborative processes; some actors may ignore them entirely, whereas others may believe collaboration is a meaningless exercise and resist attempts to build consensus (Diduck and Sinclair 2002). A number of the articles in this special issue address the role of diverse types of actors in collaborative forums and investigate topics such as the context in which actors try to hinder coalition building or, on the contrary, to support it.

Damonte (2019) analyzed the strategies a powerful coalition of agricultural producers has used to maintain political dominance. He elaborated on how conflict over groundwater resources spans issues, including the reach of formal government institutions and the rule of law and how conflict is closely linked to related conflicts over access rights and land use in Peru. The study also engages with an important debate in the water governance literature on the role of technical knowledge in decision-making processes (see also Mancilla García and Bodin 2019). A key finding relates to

how large agri-business coalitions use the discourse of expertise and technical knowledge to frame themselves as better managers of water resources than others. Damonte disentangles how the discursive framing of neoliberal development and "water efficiency" is fundamental to explaining how the agri-business elite control the conditions for continued depletion of a groundwater aquifer it considers an "agricultural export miracle."

Dupuits (2019) similarly discussed how water governance has historically been framed as a technical management problem, and how such framing has tended both to depoliticize water and mask the numerous interests and visions that exist around water governance. Specifically, Dupuits presented an analysis of strategies recently adopted by the Latin American Confederation of Community Organizations for Water Services and Sanitation, which were implemented to professionalize the confederation network and distance itself from antiprivatization movements. This technical perspective on water governance presupposes that interests around water governance can and should be expressed in technical terms, and that by doing so the most appropriate way of managing water will emerge. This technical framing is often at odds with perspectives on water governance held by traditionally excluded actors, such as peasant communities or environmental groups.

One way to examine meaningful participation is through actors' perceptions of the fairness of collaborative decision-making processes, which is front and center in the article contributed by Hamilton (2018) on climate change adaptation in the Lake Victoria basin in East Africa. In this context, variation in authority and capacity among diverse groups of participants, including local and international NGOs, ministries, and donors, highlights the need for procedural fairness. Using data on actors' collaborations with one another as well as their participation in multiple decision-making processes, Hamilton examined how perceptions of fairness depend on how actors are embedded in the broader policy system. The study presents evidence that actors with greater social capital, capacity, and authority perceive decision-making processes to be fairer than do their less advantaged counterparts who participate in the same decision-making processes.

The resilience of governance networks over time is at the heart of the study Cisneros (2019) conducted on watershed councils in Ecuador. By comparing how the structures of collaboration evolved within two councils in response to a major policy change, Cisneros demonstrated how internal variables, such as trust and resources for subsidizing participation, play an important role in the resilience of collaboration in the face of shocks to the governance system. A key finding is that the diversity of actors within watershed councils can be beneficial for mobilizing resources to support collaborative processes, but not when diversity is related to the presence of many external actors (e.g., NGOs).

Considering that collaboration is not easy and that not all participants are equal, leaders play an important role in collaborative processes. Two articles in the special issue discuss this topic. Berardo et al. (2019) assessed who the key coordinators are in managing nutrient pollution in the Maumee River watershed and the extent to which "coordination fit" exists, as

this is a central concern in multiscale and boundary-spanning governance settings. Dupuits (2019) provided an in-depth analysis of a network of social movements in Latin America and identified cases of both elite capture and citizen leadership, which illustrates how leadership can acquire different meanings in practice.

## CONCLUSION

The trend toward collaborative forms of governance has largely been driven by the increasing recognition, and consequences, of the interconnectedness of water resources across biophysical and sociopolitical boundaries, both within and across scales (Moss and Newig 2010). Achieving effective and sustainable governance of water resources therefore involves a critical restructuring of the current piecemeal approach in which human-made boundaries still largely define who is involved in managing which features of shared water resources. However, as the articles in this special issue illustrate, transitioning to new institutional arrangements for governing water resources is not a simple process, nor is it necessarily a linear one. Conflict and other unintended consequences are a natural part of this transition and must be understood and addressed to unlock the theorized benefits of collaboration presented in the broad water governance literature.

The articles in this special issue touch on important aspects of both collaboration and conflict, and strongly suggest that future research on water governance should explicitly frame and analyze both as two sides of the same coin. Indeed, beyond framing collaboration as a solution to conflict, this special issue highlights how conflict can also present an opportunity for building collaboration and strengthening water governance institutions. Lastly, specific instances of these general issues occur across a wide development gradient, suggesting collaboration and conflict are universally important and present universal challenges. However, the solutions to these challenges will likely vary according to the local social-ecological context. Given the foundational role water resources play in the healthy functioning of social-ecological systems, from the local to the global scale, identifying the circumstances under which certain solutions lead to effective and sustainable water governance systems is an important avenue for future empirical research.

Responses to this article can be read online at:  
<http://www.ecologyandsociety.org/issues/responses.php/11133>

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## Acknowledgments:

The authors thank Guidance for Resilience in the Anthropocene (GRAID) and affiliated staff at the Stockholm Resilience Centre for providing support for the workshop that resulted in this special issue.

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