Global Environmental Change 55 (2019) 139–148

Contents lists available at ScienceDirect

Global Environmental Change

journal homepage: www.elsevier.com/locate/gloenvcha

Participatory Water Basin Councils in Peru and Brazil: Expert discourses as means and barriers to inclusion

María Mancilla García*, Örjan Bodin

Stockholm Resilience Centre, Stockholm University, Sweden

ARTICLE INFO

Keywords:
Participation
Expert discourses
Water basin councils
Peru
Brazil

ABSTRACT

In the last twenty years, participatory forums have been increasingly used to manage water basins around the world. The implementation of participatory forums has sought to prevent and overcome conflicts by bringing together a multiplicity of stakeholders in joint efforts to deliberate, achieve mutually agreed upon decisions, and distribute limited water resources. Different literature streams have evaluated the benefits and challenges of participatory forums in practice, such as the difficulties some forums have had when confronting existing power structures. Separately, research on water governance has paid particular attention to the ways in which expert discourses are used by traditionally powerful actors to exclude less powerful others. This paper draws from the literatures on participation and discourses in environmental governance to empirically investigate how expert discourses may empower or disempower certain actors in four basin councils – two in Peru and two in Brazil. Through qualitative thematic analysis of 116 interviews and observation notes, we specifically investigate the extent to which expert discourses in these basin councils help empower previously excluded actors. Our findings indicate stakeholder interests that are not, or cannot, be expressed within the frame of expert discourses are often marginalized. This suggests participation has made it possible for some previously excluded actors to have a voice, yet their potential influence is seemingly confined to a restricted space beyond which their voices will have little effect.

1. Introduction

Research on environmental governance has paid significant attention to the issue of participation. While this topic has been studied from many disciplinary perspectives, the literature broadly seeks to understand whether participation brings an actual change to existing governing structures and processes (Berry and Mollard, 2010; Cronin and Ostergren, 2007; Fiorino, 1990; Renn et al., 1995). These studies explore the benefits and pitfalls of participatory governance both in terms of fairness to the participants involved, and the environmental outcomes obtained (Dryzek, 2013; Smith, 2003).

The literature on participatory water governance has largely focused on one type of institution: basin forums (Abers and Keck, 2006; Conca et al., 2006; Molle, 2009a; Tankha and Fuller, 2010; Lubell and Lippert, 2011; Schmeier et al., 2016). All basin forums seek to move beyond consulting citizens, to integrate government entities, private users, and civil society into the water governance process. Yet, they may have different structures, aims, and agendas depending on the biophysical and socio-political context in which they are set. Basin forums have their own unique institutional histories and they face context-dependent power distributions in which different actors, policy preferences, and discourses might dominate. While some studies of participation have identified potential upsides of participatory forums, such as empowering and engaging a broad set of stakeholders and paving the way for new and more inclusive ecosystem-oriented ways of governing environmental resources (Olsson et al., 2004; Gerlak, 2017), political ecologists have noted how expert discourses may be used to perpetuate the exclusion of certain actors in governance institutions (Mitchell, 2002; Budds, 2009; Strang, 2013; Fearnside, 2013).

In this paper, we seek to answer the following research question: how, and by whom, are expert discourses used in participatory basin forums? We investigate whether these forums provide spaces to use dominant discourses in ways that empower traditionally excluded actors to engage in water governance. We conducted empirical research in Peru and Brazil, where we interviewed participants in four water basin councils (two in each country) about their perceptions and experiences of participation. We developed a thematic analysis of the responses in which the themes were determined abductively: a first list of themes was drawn after the analysis of the literature, and these were subsequently examined and revised against the empirical data. We devoted

* Corresponding author at: Stockholm Resilience Centre, Stockholm University, Kräftriket 2B, 106-91, Stockholm, Sweden.
E-mail addresses: maria.mgarcia@su.se (M. Mancilla García), örjan.bodin@su.se (Ö. Bodin).

https://doi.org/10.1016/j.gloenvcha.2019.02.005
Received 17 January 2018; Received in revised form 30 January 2019; Accepted 10 February 2019

special attention in our analyses to identifying the power dynamics at play in the inclusion of new participants, and the role that expert discourses played in enhancing or hindering such inclusion.

Our choice of cases allows for an interesting comparison since the two countries possess key institutional differences: in Brazil, basin forums have formal decision-making power, whereas in Peru they are only consultative entities. Moreover, the creation of basin forums in Brazil began in 1996, whereas in Peru the first forums were established in the past decade. Since we are interested in everyday practices – which often display a fairly high level of intertia and thus long time frames are needed to observe change (Lubell et al., 2009; Sandström et al., 2014) – it is important to investigate if forums that have existed for longer have managed to provide opportunities for traditionally excluded actors to gain a voice. Moreover, water management is institutionalised in very different terms in each of the countries. In Peru, water has traditionally been the responsibility of the Ministry of Agriculture, which used water management to benefit the development of irrigation on the coast. In Brazil, the river that we have studied has historically been managed by the hydroelectric sector. Additionally, in Brazil the composition of the forums is decided by the forums themselves, as long as they ensure participation of the three "sectors" identified by law – civil society, private users and government entities – and that they respect the legal requirement that government entities do not surpass 50% of the seats (L9433, C3, Art.37, 1). In Peru, by contrast, who participates in the council is determined by law (see Appendix 1). The two countries therefore present different models although both are labelled as participatory forums for basin governance. By comparing these two cases, we aim to tease out the links between expert discourses and the contextual differences of these cases with the hope of gaining deeper insight into when expert framings serve as a tool for exclusion, and when they are used to include others.

2. Theoretical framework

2.1. Participatory environmental and water governance

Participation continues to be a core topic in the literature on environmental governance, and over time this focus has led to a multitude of aligned concepts and frameworks all emphasizing the value of participation to some extent. We find, for example, concepts and frameworks such as "governance", "collaborative governance", "co-management", "adaptive co-management", "adaptive governance", "interactive governance", "stakeholder engagement", "civic participation", "effective participation", "deliberative democracy", etc. Here we follow the definition of participatory governance given by Newig et al.: "processes and structures of public decision making that engage actors from the private sector, civil society, and/or the public at large, with varying degrees of communication, collaboration and delegation of decision power to participants" (2017 p. 5). Participatory governance "stresses the involvement of actors who are not normally charged with decision making" (Newig et al., 2017 p. 4). Newig et al.'s definition fits well with the question we pose here in studying whether participatory forums constitute spaces where discourses can be used to bring about change in governance processes and structures, thereby giving voice to diverse actors. We similarly follow Renn, Webler and Wiedermann in moving away from the dichotomy in which participation is "either an activity that stabilizes society (thereby serving the interests of the ruling elite), or [as] a mechanism to accelerate social change (thereby empowering citizens)" (1995 p. 8), and emphasize exploring the gray area in between.

The literature on participatory *environmental* governance aims at evaluating participation in terms of it being simultaneously beneficial for furthering democracy, and managerial effectiveness, i.e. the ability to deliver desirable social and ecological outcomes (Dryzek, 2013; Smith, 2003). The critical literature on environmental governance has questioned the assumption that participation would automatically lead to both, and has evaluated trade-offs and pitfalls as well as contextual and structural conditions explaining the success of certain institutions in concrete cases (Renn et al., 1995).

Some research has, for example, argued that participatory arrangements often more easily adjust to local and changing conditions and better respond to new knowledge than traditional top-down burecratic government arrangements (Holling and Meffe, 1990; Folke et al., 2005; Ostrom, 2010). Other research has put forward an experimental approach in which new and better knowledge can be developed through adaptive management by including different knowledge systems (Beierle and Cayford, 2002; Fazey et al., 2013; Fung, 2006; Ulibarri, 2015; Ostrom, 1990; Berkes and Folke, 1998; Folke et al., 2005; Tengö et al., 2014, 2017), which can foster social learning (Edelenbos et al., 2011; Fazey et al., 2013; Heikkila and Gerlak, 2013). Some studies insist on the benefits of the participation process in-and-of-itself, for example, trust building among participants (McGuire, 2006; Pahl-Wostl et al., 2007; Lubell and Lippert, 2011). An underpinning logic across these broad bodies of literature is that, under certain conditions, actors with different interests are able to devise, agree upon, and maintain jointly defined rules and practices regarding how to manage a common resource or how to distribute environmental benefits and damages in society.

The literature has also critically evaluated participatory governance initiatives (Fung and Wright, 2003; Smith, 2009, Dyer et al., 2014), identified reasons why they have met short-comings (Huitema and Meijerink, 2014) and put forward ideas for improved participatory models, specifically explaining under which conditions different models can foster meaningful participation (Renn et al., 1995). Among the key contributions, we identify discussions on (i) whether it is possible to achieve a neutral deliberative space (Cornwall and Coelho, 2006; Akbulut and Soylu, 2012; Birnbaum et al., 2015); (ii) the capture of participatory mechanisms by traditional local elites, reflecting existing power asymmetries (Huitema and Meijerink, 2017); (iii) the lack of independence of these institutions respective to the central state (Davos and Lajano, 2001; Few et al., 2007; Barnaud and Paassen, 2013); and (iv) the actual representativity of participants, in terms of making traditionally excluded voices and narratives heard (Plumwood, 1991, 2006; Cooke and Kothari, 2001; Reed, 2008; Cook and Spray, 2013). Additionally, the literature on environmental governance has specifically sought to determine whether participatory processes effectively lead to more sustainable environmental outcomes (Newig, 2007; Newig and Fritsch, 2009; Young et al., 2013) and recent work has sought to more clearly and systematically uncover causal mechanisms linking participation to environmental outcomes (Newig et al., 2017).

Water governance is a particularly interesting area to investigate participatory governance because under the Integrated Water Research Management perspective (Halbe et al., 2013), participatory forums for water governance bring together a broad range of stakeholders. These forums – typically set up on a permanent basis – are considered a substantive innovation in water governance (Huitema and Meijerink, 2017).

2.2. Expert discourses and participatory water governance

Several researchers have classified the most prevalent discourses in environmental management (Williams and Matheny, 1995; Dryzek, 2013) and in water management in particular (Gupta, 2009). For reasons of space, we specifically focus here on the interplay between uses of expert discourses and power dynamics in participatory forums. We group under the category "expert discourses" those discourses that are inherently "technical", "scientific" and "managerial" (see also Dryzek's "administrative rationalism", 2013).

As Williams and Matheny explain in their analysis of managerial discourse, the logic underpinning this type of discourse is inherited from positivism and utilitarianism: there are natural laws and experts are there to understand them and efficiently manage "nature" as a

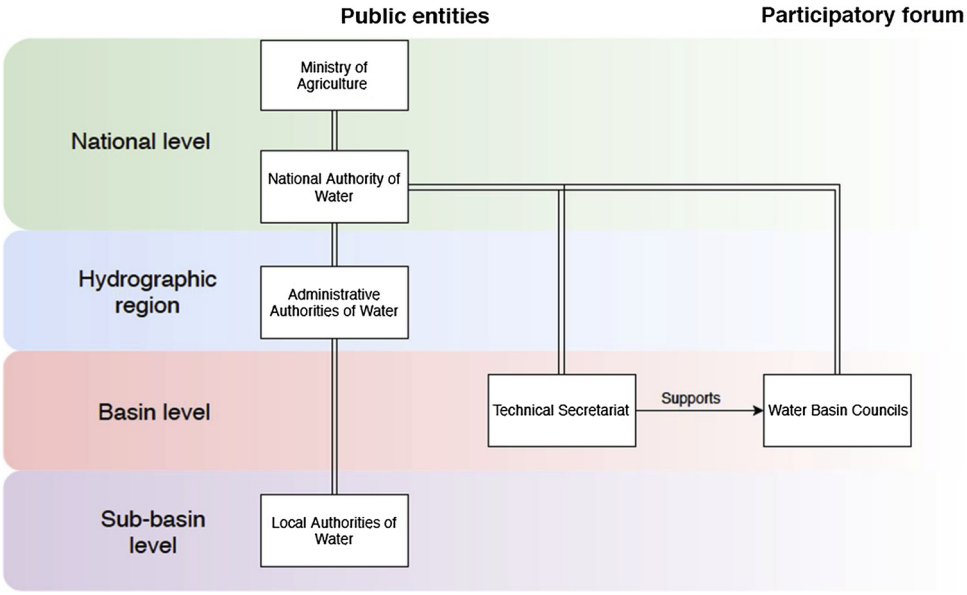

Fig. 1. Peruvian water management system.

result. These discourses present the logic they defend as obviously desirable, or even neutral, with an emphasis on engineering and economic expertise (Huitema, 2002). Numerous empirical cases have shown how expert discourses have been used as a tool to hide the politicised nature of water governance (Mitchell, 2002; Budds, 2009; Molle, 2009b; Swyngedouw, 2013; Boelens et al., 2016).

Yet, owing to the characteristics of their institutional design, participatory forums can be seen as part of a transition from a perspective on water as a resource to be managed by "managers", to one in which its politicised essence is recognised by including other voices in management (Pahl-Wostl et al., 2007; Mollinga, 2008; Berry and Mollard, 2010). The inclusion of these other voices resonates with Dryzek's "democratic pragmatism" discourse, in which it is recognised that agents are self-interested, but can think of public interest when in dialogue with others (Dryzek, 2013). We can also find commonalities with the communitarian discourse identified by William and Matheny in that the communitarian discourse emphasizes the validity of different types of knowledge and the importance of repeated interactions to forge participants' interests. However, the communitarian discourse strongly focuses on local communities and argues that the local is key in forging special relationships with nature. These communities are thus different from the "stakeholder communities" brought together in basin forums. Another important difference is the rejection of technological and economic development at play in the communitarian discourse.

To further refine our theoretical framework, we draw inspiration from Hajer's perspective on discourse analysis, i.e. going beyond language to conceive of discourse as "a specific ensemble of ideas, concepts, and categorizations that are produced, reproduced and transformed in a particular set of practices and through which meaning is given to physical and social realities" (Hajer, 1997 p. 60). Hajer contends that interests are constituted through discourses, which are at the same time constraining and enabling, and provides a flexible perspective on discourses which can be used differently by different people. We complement this perspective by following Huitema (2002) on acknowledging that interests pre-exist practices and exchanges with others, although these might change through interaction. Both scholars agree that power is not located in one place or held by one actor, but rather can be conceived as occurring in specific practices. Additionally, as Huitema (2002) asserts, such practices need to be studied in tandem with institutional changes, to understand the extent to which institutional changes bring about actual changes in governance.

In this paper we try to understand how, and by whom, expert discourses are used in four concrete cases of water basin forums. While a reasonable point of depature is the assumption that some participants in water governance forums are better placed than others to frame their interests in expert terms, we investigate if those are necessarily the ones that typically represent structures of power (such as the state or large resource-rich private corporations).

3. The cases: institutional context in Brazil and Peru

Water management in Peru and Brazil, like much of Latin America, was characterized by the dominance of technical knowledge during the 20th century, in the form of imposed expert discourses (Budds, 2009; Lynch, 2009; Seeman, 2015). In the last ten years, the water management system in Peru underwent important changes as the country tried to implement principles inspired in Integrated Water Resource Management, such as introducing participatory governance structures and promoting a holistic vision of water accounting for different interests. Yet, the ultimate authority in the sector, the National Water Authority (ANA for its acronym in Spanish, Autoridad Nacional del Agua), created in 2008, was placed in the Ministry of Agriculture, which represents, even today, the most powerful sector involved in water management: irrigation (Damonte Valencia, 2015; Oré and Geng, 2015).

The reforms implemented since 2008 in the water sector, have led to a restructuring of the institutional system which included the creation of participatory organizations, the Water Councils, at the basin level (see Appendix 1 for details). The councils are part of the ANA (art. 24, Chapter IV, Law 29338), which means that they are not independent institutions. Indeed, the ANA holds exclusive prerogative over water management (art. 4). A technical secretariat is attached to the council, whose role is to assist the council and guide it as part of the national system of management (Fig. 1). The secretariat is staffed with ANA officers, who are mainly irrigation engineers, which suggests that the irrigation sector is still predominant in water governance. This implies that a certain vision of water governance, oriented to agricultural development is institutionalized (Lynch, 2012).

The Brazilian legislation on water resources was approved in 1997, through law 9433. This law establishes the National Water Resource Management System which includes the creation of water basin councils (see Appendix 1 for details) and of water agencies, taking inspiration from the French model of management and building on the basis of the 1988 Brazilian Constitution, which established two fundamental principles: water is a public asset and the jurisdiction over it is shared

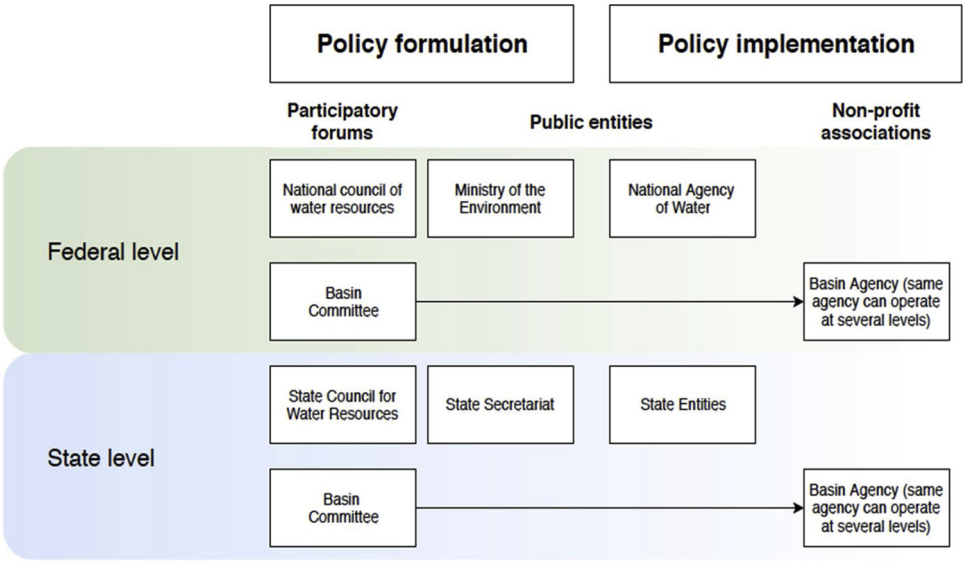

Fig. 2. Brazilian Water Management System (adapted from MMA, 2018; see also Mancilla García and Bodin, 2018).

between the states and the federal level. Additionally, the law creates Water Resource Councils at the state and national levels and their executive branch, State Water Resource Management Entities (Fig. 2). It was only in the year 2000 that the National Water Agency was created, with the responsibility of implementing water policy instruments at the national level. The Brazilian agency is part of the Ministry of the Environment, and the Minister of the Environment is the president of the National Water Resource Council, the highest organization in terms of water management at the federal level.

The description of the Peruvian and Brazilian systems above points to different institutional choices when it comes to institutionalizing participation in water governance. The institutional history of the forums is also very different in each country. While they were set up by a group of stakeholders convinced of the value of participation as key for environmental governance in Brazil (Abers and Keck, 2006), the first councils in Peru were introduced in the framework of a funding agreement with the World Bank and the Inter-American Development Bank.

We take the differences between the councils discussed in this section – time of existence, institutional history, and institutional design chosen – as an interesting basis to compare the ways in which expert discourses are used in the everyday practices of the councils. We take an institutional change (the introduction of water basin councils), with its contextual specificities, as a starting point to investigate how, and by whom, expert discourses are used in these forums.

4. Methods

This study is part of a larger project investigating the strategies adopted by actors and networks of actors across multiple water governance forums. The data used for this article were collected through interviews and observation notes produced during seven months of fieldwork in Peru and Brazil. Four basin forums were selected for this study, two in Peru and two in Brazil. Those forums are: 1) the federal council – CEIVAP, which stands for Committee for the Integration of the Paraíba do Sul River Basin – of river Paraíba do Sul; 2) one of the state-based councils, the Médio Paraíba do Sul (CMPS), which is in charge of managing a segment of the river Paraíba do Sul situated within the state of Rio de Janeiro; 3) the basin council in charge of Chancay-Huaral rivers basin in the Lima region; and 4) the basin council in charge of the Chancay-Lambayeque rivers basins in the north of Peru, flowing in the regions of Cajamarca and Lambayeque (see Fig. 3).

All participants in the four selected Water Basin Councils were included in the sample, provided that they had attended at least two meetings of the last six meetings the council had held. Of 59 registered participants in CEIVAP, 45 met that condition, of which three declined to participate in the study. In the other Brazilian council, the CMPS, one participant declined to take part in this study and another one did not meet the necessary conditions, thus a total of 22 people were interviewed. In Peru, all sixteen participants in the Chancay-Lambayeque council agreed to participate in the study. One participant of the eight members of the other Peruvian council, Chancay-Huaral council, declined to participate in the study, so seven people were interviewed. Officers from the national water agency in each country were interviewed as well as local academics and other key-actors such as former long-term participants in the selected councils or the staff of the executive agencies of the councils. All participants were granted confidentiality. Additionally, notes were taken during the meetings of each of the councils and meetings of other forums for water management, such as Brazilian State Councils for Water Resources meetings (Fig. 2), or meetings organized by NGOs on water resource management in Peru. The quotes presented here were selected as we felt they illustrated our findings particularly well and allowed us to get a better sense of the realities of the cases.

The data were analysed through an abductive approach (Peirce et al., 1994; Timmermans and Tavory, 2012) applied to thematic analysis (Boyatzis, 1998) which led to the development of a coding scheme. The coding of the data was performed using the qualitative data analysis software NVivo11, and was applied to the interviews and observation notes (See Appendices 2 and 3). The speech turn was considered the coding unit. In line with the abductive approach, this research did not aim to test a specific theory evaluating participatory mechanisms, but to explore the use of expert discourses in participatory process.

Besides identifying key themes in the literature and data, we explored problems associated with participation through a matrix, i.e. intersections between different codes (see Appendix 5). Building on those insights, we analysed the ways in which expert discourses were used by different actors, focusing on what was considered valid and by whom. While we follow Huitema (2002) in arguing that power allocations pre-exist encounters it is important to understand how these are defined and redefined in moments of interaction. The cases studied here provide an interesting opportunity to gain such an understanding in view of answering the research question, i.e. how, and by whom, are expert discourses used in participatory forums?

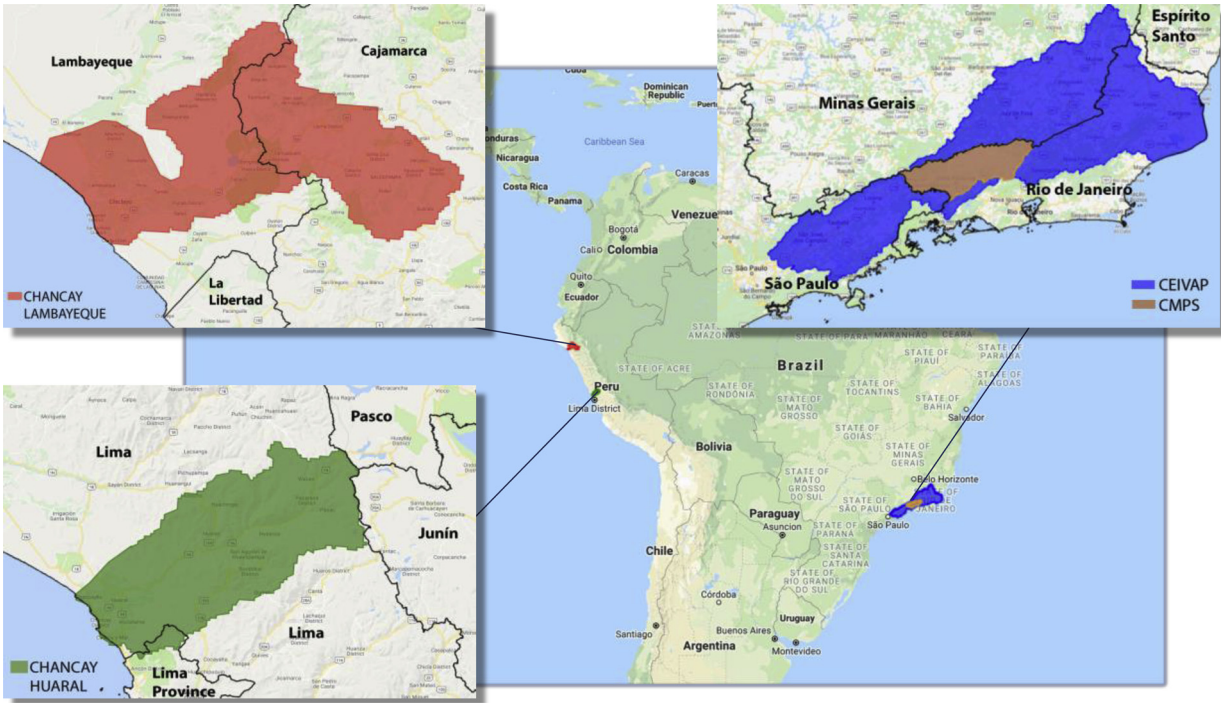

Fig. 3. Map of selected cases (Basemap Google Maps).

5. Results and discussion

In analysing our data, it emerged that the councils sought to achieve three main purposes: establish communication channels; provide a platform to include traditionally excluded actors in public policy; and build a more sustainable approach to ecosystem management. It also emerged that expert discourses occupied a central space in supporting or undermining the fulfilment of these objectives. References to "technical" or "scientific" issues are frequent in our data: of 116 sources – including interviews and observation notes – a discussion of expertise driven issues appears in 91 of them (see Appendix 4). "Technical" and "scientific" discourses are multifaceted, and disentangling their multiple meanings is a core focus here, as it will allow us to provide answers to our research question on how these discourses are used, and by whom. Firstly, we discuss how discursive practices building on expertise seem to give voice to certain actors and exclude others. Secondly, we discuss how the councils have created opportunities to access expert knowledge for some traditionally excluded actors and to express some of the historically excluded interests. Finally, we discuss how not all views of water management can be expressed in technical or scientific terms, and to what extent the councils can accommodate other discourses.

5.1. Expert discourses as a means to exclude certain actors

In our data, technical aspects of water governance emerge as part of the daily management of the basin: operating the dams, monitoring the quality and quantity of water so that management interventions can go smoothly, or more generally "ensuring the technical management" of the basin (Brazilian participant). The sustainability of the current state of the system can be questioned, but in order to manage under that state, technical knowledge is presented as a necessity.

The access to such technical knowledge was not equally distributed among council participants. In the case of Peru, peasant communities constitute a population traditionally excluded from management, both as a result of the concentration of power and economic resources in the hands of elites, and as a result of the very reduced set of opportunities to improve their livelihoods that peasant communities have had (De la Cadena, 2015). In the councils, a seat is reserved for a representative of peasant communities. However, our data suggest that the effort to explicitly include peasant communities was not sufficient to include them in governance processes, and one of the reasons for this is that lack of technical knowledge constituted a barrier to their effective participation in the councils.

Ninety percent of participants in this study had a university degree, of which more than 50% had an engineering degree. The high level of university-educated people among council participants is striking, especially in the selected regions in Peru where education attainment is low. According to the 2007 national census, only 6% of Cajamarca's population has completed higher education, including non-universitary education (INEI, 2017). Some of the participants in the Peruvian councils who did not hold an engineering degree established a difference during the interviews between them and "the engineers", who were holders of technical knowledge. "The enginners" was a category used not only to refer to colleagues in the council plenary, but also to members of the technical secretariat, i.e. the executive branch of the council (see Fig. 1). Our interviewees in Peru presented the identity of the councils as very much tied to the technical secretariat, staffed with engineers from the ANA, who prepared and oriented the discussions that council members had.

One of the Peruvian participants explained he felt misplaced to share his views about water within the council. He rather felt he was accompanying the process – guided by the technical secretariat – as a spectator. He argued that he did not have the technical knowledge necessary to advance meaningful proposals, which suggests that the councils did not provide him with the space to express his views in his own terms.

While all our Peruvian interviewees perceived the committees as technical platforms where expert discourses dominated, it is not clear that they were designed as such from the start. Several interviewees from mining companies in Peru explained that they first received the news of the implementation of the councils with suspicion, as a potential platform for antagonist actors to organise and influence public power against mining. The recent history of Peru has been dominated by the opposition between mining companies and local populations (Arellano-Yanguas, 2011), and mining representatives were well aware

of that:

> the mining sector was scared that the councils would turn into an instrument to prevent the mine, and my work was to explain what we actually do. We fought to be present in the first administration, to be the representative of non-agrarian users.

Out of the six councils that were initially established, mining companies represented non-agrarian users in five of them. Mining companies' strategy was to bet on communicating a positive image, presenting mining activities as a source of technical progress and development. They used face-to-face communication to strengthen links, a well-established approach to trust-buidling (Ostrom, 2005; Berardo et al., 2014). Mining companies present in the councils tried to provide as much information on their operations and on the system as the rest of participants would request, making use of their highly developed technical capability. In this example, the mastering of technical knowledge by mining companies put them in a key position to improve their image within the councils. In contrast, some participants were not comfortable using expert discourses, which prevented them from actively participating in the discussions held in the councils. Our observations also support these findings: there was a dominance of expert discourses, which were not confronted by alternative perspectives. In this case, participation does not seem to bring about an actual change to pre-existing governance practices.

5.2. Access to expert knowledge as a means to inclusion

Certain categories among the traditionally excluded actors appeared to be well versed in the expert discourses that dominate the councils' work. This is the case both in Brazil, where participants from civil society include biologists and ecologists working in local non-governmental organizations, and in Peru through the representation of universities and professional associations. Environmentalists and academics' proposals for reforestation, sewage treatment, data collection or environmental education were based on scientific and technical knowledge and found their place in the council. In many of our interviews, technical knowledge was often presented as "neutral", "apolitical" and therefore good, conflict free, as this Brazilian participant puts it:

> What I see as an exit issue [a possible solution to conflicts] is not to discuss political aspects, only technical aspects. If you have a strong solid proposal, a technical proposal, then the political aspect has to be built [to defend your political views] but if not [if you don't have a technical proposal], it is impossible [to discuss it, to work on it].

This interviewee suggests that participants in the council can only discuss problems if framed technically, regardless of the interests that are defended ("the political aspects"). This resonates with Hajer's concept of discourse structuration, which refers to a situation in which "the credibility of actors in a given domain requires them to draw on the ideas, concepts, and categories of a given discourse" (Hajer, 1997 pp. 60–61). It also confirms previous findings in the literature, such as for example, Huitema's claim that framing their interests within the managerial discourse helped actors achieve credibility (2002). This is also coherent with the findings of Lemos et al. (2010) on Brazilian water governance. While acknowledging power dynamics, these authors argue that technical knowledge serves to empower certain actors. Indeed, by framing projects in a specific language and communicating the relevance of them in that language, actors can obtain the attention of others. This suggests that the use of expert discourses goes beyond the categories that have traditionally dominated water governance in each of the selected cases, namely large agricultural producers and mining companies in Peru, and large private users in the Brazilian cases.

In Peru, tensions between different territories have traditionally existed when it comes to water management, specifically between the coast and the mountains (Cano, 2013). The coast and, thus, the downstream actors have historically been prioritized since it is there that agro-industrial businesses plant their crops. The Peruvian council of Chancay Lambayeque provided an opportunity to communicate between upstream (the mountains) and downstream (the coast) representatives, in such a fashion that it led to a modification of the water management plan that the council was producing at the time of our interviews. As both our interviewees from the ANA and from the upper part of the Chancay Lambayeque basin revealed, the first version of the basin plan was very much oriented to the downstream agricultural producers of the coast. The participation of actors from upstream parts of the basin and in particular, the participation of the representatives of the professional schools of the area, of the university and of upstream municipalities, who had the capacity to frame their problems and vision in scientific and technical terms, brought in a different perspective. They presented their problems – such as the difficulties in retaining water in the upper part of the basin – as problems of the basin that would eventually affect the downstream area. For example, they argued that if water was not retained in the upper part, the risk of floods and landslides was higher for downstream populations. The solutions they presented were also framed technically: they proposed the building of dams and canals for agriculture in the upstream part of the basin. The specific problems they faced hadn't initially been taken into account in the basin plan, but their contributions were understood and the diagnosis in the plan was modified to account for their perspective. The council played a crucial role in ensuring that actors who had not communicated before, would do so (Koontz and Thomas, 2006; Pellizzoni, 2013). This resonates with the literature findings on the role of participatory mechanisms to faciliate cooperative practices and overcome conflicts (Cronin and Ostergren, 2007; Burt, 2001; Coleman, 1990; Dolšak and Ostrom, 2003; Berardo et al., 2014). It provides an instance of participation producing an actual change and leading to an outcome that integrates different interests. Yet, this example also presents a case of discourse structuration à la Hajer since participants established new communication channels because they were able to express their concerns about basin dynamics in technical terms. Additionally, it raises questions about the extent to which new interests can be integrated through participation in the councils since upstream actors' concerns were presented as related to the interests of traditionally powerful actors, i.e. downstream irrigators. Therefore, expert discourses were used to include previously excluded interests by presenting them as relevant to traditionally dominant interests.

Several options were available for previously excluded actors to gain the necessary knowledge to communicate in a technical language. In Brazil, representatives from civil society reported on the learning processes in which they engaged by participating in the council's technical chambers or the executive agency directorate. Additionally, in Brazil the councils' executive agency had permanent offices in the region that participants could visit and through these visits get access to data and technical specialists "free of charge". The literature has indeed argued that exposure to technical knowledge enhances non-expert capacity and willingness to collaborate (Mascarenhas and Scarce, 2004; Webler, Tuler, and Krueger, 2001) and some authors defend that this should be one of the purposes of public participation (Webler, 1995 p. 55). Conversely, in some of the remote areas of Peru, our interviewees complained that the Local Authorities of Water (which are part of the National Agency of Water, see Fig. 1) were understaffed and that as a consequence "engineers" were not available to discuss water governance issues when relevant.

Water governance frequently involves complex problems and, as such, the understanding of those takes time and effort (Newig, 2007; Antunes et al., 2009). We are aware that not all participants have such time or capacities. In the cases studied, this particularly affects small municipalities and peasant communities. Indeed, one of the issues that the literature pinpoints as perpetuating exclusion is that marginalized people lack time to participate (Diduck and Sinclair, 2002; Davies and

White, 2012; Lund and Saito-Jensen, 2013). Additionally, the long-term stable presence of water governance institutions is a necessary requirement to guarantee access and exposure to technical knowledge and, by extension, fluency in expert discourses. This can help us explain why the Brazilian system, which has existed for longer than the Peruvian system, might provide a learning opportunity to participants that is not necessarily linked to the knowledge they have acquired through their own individual training. This constitutes a significant change in accessing knowledge, brought about by institutional change.

5.3. Beyond technical and scientific expertise

As we have seen in the previous sections, the existence of physical infrastructure imposes a technical framing to governance discussions and, thus, access to technical knowledge is central to issues of inclusion. However, not all concerns can be framed in technical or scientific terms. For example, different understandings of what is water, such as those traditionally held by indigenous communities, cannot be translated into a technical discourse and as a result did not get expressed in the forums. We discuss this issue in this section.

In Peru, some of our interviewees pinpointed that it would be difficult for those participants without a "technical" understanding of the issues at stake to be influential in the council. When commenting on the case of peasant communities in the Andes, one of our interviewees considered that they should elect their representative in the council based on whether or not the person had sufficient technical knowledge to translate their interests into technical terms. This supposes (i) that communities' interests regarding water can be translated into technical terms and (ii) that the council cannot accommodate concerns that are not technical. Peasant communities are typically represented by their president, who occupies that position for one or two years, depending on the community. This position falls on a member of each family in the community on a rotational basis. The person holding the presidential position will usually represent the community whenever needed, regardless of their specific skills. In this light, the fact that some participants felt they were accompanying the process and not part of it echoes the literature that presents expert discourses as exclusive of other understandings (Hajer, 1997).

Several of our participants indicated that certain communities refused to participate in the councils as they anticipated manipulation and disrespect of their understanding of the world. The following quote from a Peruvian participant is informing in that sense:

> I meet with several communities but people from rural areas don't want to know anything about it [the council], they think they are going to take the water away from them.

This raises questions about the extent to which the councils establish fair spaces in which different discourses can be expressed and confrontations can be managed, or whether they give yet another platform for powerful actors to establish their domination by imposing certain visions and certain framings of the issues at stake (Henry, 2011; Ingold, 2011; Matti and Sandström, 2011).

The case of mining companies further informs this issue. Communities' resistance to mining development in Peru is a multifaceted issue: while some communities – or some community members – might be willing to express their interests in technical terms, others might refuse to do so (Armijos, 2005). The vision of development characterized by material gain and supported through extractivist dynamics and financial investment that mining companies put forward has been widely contested among Andean communities in Peru and elsewhere (Bebbington and Humphreys Bebbington, 2011). Such contestation is based on the existence of radically different understandings of, for example, mountains or lagoons, either as resources that can be transformed into economic assets, or as "earth-beings" (De la Cadena, 2015). Anthropologists Marisol de la Cadena (2015) or Arturo Escobar (2018) present indigenous worldviews as relational, in which people cannot be understood as separate from the land (and its water) but emerging through the relationship they have with it. For reasons of space, we cannot discuss in depth these issues here.

Mining companies participating in the councils in Peru declared themselves interested in hearing "communities' demands", which raises the question of what they considered to be such demands. The kind of demands that mining companies were hoping to identify seemed to relate to an understanding of development as economic gain. Implicitly, the vision of "earth-beings" as living beings, which clashes with the mining companies' own visions, would likely not be seen as something to seriously consider no matter how it was expressed. Said otherwise, mining representatives seemed to be hoping to hear communities' demands framed in terms that do not fundamentally contradict their own interests but that rather are something they could engage with and contribute to, such as bringing in new technologies. This again encourages us to further reflect on the complexity of community representation in the councils: are the views of communities in any given region better framed in technical terms, or in terms of a radically different perspective, building on indigenous worldviews? Can the council accommodate such different views? It seems improbable. While different discursive practices such as those put forward by hydraulic engineers, agronomous engineers or environmental engineers, seemed to find a place in the council, it was as long as they could be articulated within expert discourses. Other perspectives, such as those of indigenous communities in the Andes for whom water is not necessarily conceived as a resource to manage, but rather as part of an understanding of their own identities and practices, did not find such place.

It is also important to remember that our Peruvian interviewees perceived the council as directly linked to the Peruvian state, in this case the National Authority of Water. The literature has identified the lack of trust between communities and the state – suspected of seeking to benefit financial interests rather than communities' – as a recurrent problem in the Andes (Crabtree and Whitehead, 2008; Mancilla Garcöa, 2017; Purdy, 2012). This, associated to the fact that Peruvian legislation set up these councils as consultative, instead of as decision-making entities as they are in Brazil, suggests that communities might have chosen not to invest their efforts in making their voices heard in this space. It also opens the question as to what would have happened if these councils would have been given more power in legislation.

In the Brazilian councils, the technical chambers – a sub-organisation in which some elected members of the plenary participated – excerted power in that they acted as a filter in determining the kind of topics that would be discussed in the plenary. Some of our interviewees indicated that this filter prevented key issues from reaching the plenary, or that when they actually reached the plenary they had already been decided beforehand. One of the civil society representatives in Brazil indicated that he felt civil society representatives were "doing damage control". As he put it "we are there and we know that if we weren't, it would be much worse". Indeed, he explained they could claim and demand that documents be presented and followed up in different projects. This resonates with the idea that being involved increases the chances of raising concerns and leading to better environmental outcomes (Brody, 2003; Newig et al., 2017). Yet, this actor felt they were unable to bring key issues to the table, such as the kind of development model followed in the region. Other representatives from civil society saw the forums as an opportunity to bring in controversial issues for discussion. Our observations also confirm that issues such as the level of payment that should be imposed on water users were discussed from very different standpoints – such as economic development versus environmental protection – although all of them had recourse to expert framings.

6. Conclusion

The cases presented here show that expert discourses are used by a broad set of participants that goes beyond traditionally powerful actors,

such as resource-rich private sector actors or government representatives. However, our results also show that actors who do not express themselves in expert terms – either because they lack the knowledge to do so or because their understandings of the issues at stake do not fit in the categories imposed by expert discourses – remain excluded.

In Brazil, environmentalists participating in each of the councils studied explained their participation allowed them to push for the implementation of reforestation projects and to supervise projects put forward by other stakeholders. In one of the councils studied in Peru, upstream and downstream regions managed to communicate their respective needs. While both downstream and upstream actors had clearly defined interests, they were able to redefine and reconcile them through discussions in the council. Both Brazilian environmentalists and upstream actors in Peru felt that these outcomes constituted a change in previous practices brought about by their participation in the council. These previously excluded actors felt their voices were heard in the council as they framed their concerns within the expert discourse.

Yet, upstream actors in Peru framed their concerns as relevant for the traditionally dominant downstream irrigation sector. Therefore, we can also understand this case as expanding the range of interests downstream actors have, rather than challenging previous power dynamics. Future research should investigate whether environmentally ambitious or conflictive projects that challenge current water uses – even if framed in technical terms – would also find a place in the forums.

As technical platforms, the councils also help to concentrate power in certain hands and to exclude other knowledge systems or worldviews such as those of certain local communities. Mining companies used their technical knowledge to consolidate their position in the management system. Conversely, certain representatives in the Peruvian councils shared their unease in expressing their views in their own terms in such spaces, which is proof that, at least to a certain extent, discourses "make it impossible to raise certain questions or argue certain cases; they imply exclusionary systems because they only authorize certain people to participate in a discourse; they come with discursive forms of internal discipline through which a discursive order is maintained" (Hajer, 1997 p. 49).

A caveat, however, is that our analysis of the cases builds on four basin councils in two countries, and it is necessary to study these issues across more, and more varied cases to determine whether the findings are more broadly applicable. This is an especially important issue to delve deeper into in Peru for three reasons: (i) as recently introduced forums, the Peruvian councils haven't received much attention in the literature yet; (ii) our data show that the councils were not perceived by all actors as inherently technical platforms from the start, which suggests that there was a window of opportunity for the councils to be more inclusive before they became technical platforms; and (iii) the literature on the Andes has pinpointed issues of mistrust between communities and the State, and it would be interesting to study how this plays out in the councils when they have existed for longer. Based on our analysis of the two countries studied, it seems the duration of existence of the councils matters for certain actors who use these spaces as a means to gain technical knowledge. For this reason, participants reported the importance of stable institutional arrangements where they recurrently have access to data and support from staff. This, however, does not seem to be the case for all actors; as we saw in the case of upstream and downstream users, an alignment of interests was immediately achieved just by different actors being brought together. It is also crucial to investigate the evolution of these issues in Peru as more councils are established and the institutional landscape expands. An open question remains as to whether indigenous and peasant communities would invest more effort in participating in the councils if they were decision-making entities, as they are in Brazil.

In summary, our results suggest that technical approaches consolidate certain social arrangements in terms of the repartition of benefits (Hoogesteger et al., 2016) and define the nature of the problem in certain ways (Boelens, 2014), but such ways are complex and contested. Contestation might not bring system transformations but can challenge the system, such as when actors use technical knowledge to defend previously excluded interests (e.g. those of environmentalists) and to hold others accountable or to constitute new alliances (e.g. between upstream and downstream users). Since the systems studied here are entangled with rather complicated technical aspects of water management, not having the technical knowledge to understand how they work constitutes a barrier to participation in the governance of the resources (Radaelli, 1999; Berardo et al., 2014). Conversely, this means that those who have access to such knowledge and manage to frame their interests in technical discursive terms can have a say. Although some actors find ways to navigate the limitations imposed by the dominance of the technical discourse, bridging the political and technical divide to ensure a meaningful participation of all is a challenge yet to be met (Safford, 2010).

Comparing these cases is interesting both to see the prevalence of expert discourses in forums that are crafted under a deliberative logic, and to ask new questions about the conditions that matter to make participation in forums meaningful. Although generalizing from just four cases is not possible, we believe our study points to interesting avenues for future research that may be relevant across cases. More research on the everyday discursive practices in participatory forums and specifically on what kind of changes the appropriation of certain discourses by previously excluded actors leads to in different contexts would be highly relevant for the field. We encourage future studies to investigate the cases presented here at other points in time, as well as other new cases, since, as the literature on participation argues and we have shown here, the possibility to actually integrate new voices in the councils is context dependent and it is especially influenced by historical power distributions. Futures studies should pay particular attention to whether power dynamics evolve in the context of participatory processes, and under which conditions issues framed outside of expert discourses can find a place.

Declarations of interest

None.

Acknowledgements

This project received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement 660394. We would like to thank Andrea Nascetti for his help with images, Jacob Hileman and Jennifer Hinton for their help with language, and all participants for taking part in this project. We extend our acknowledgements to Paúl Cisneros and Matthew Hamilton for their comments on the surveys. We would also like to thank two anonymous reviewers for their constructive comments on previous versions of the manuscript.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.gloenvcha.2019.02.005.

References

Abers, R., Keck, M., 2006. Muddy waters: the political construction of deliberative river basin governance in Brazil. Int. J. Urban Reg. Res. 30, 601–622. https://doi.org/10.1111/j.1468-2427.2006.00691.x.

Akbulut, B., Soylu, C., 2012. An inquiry into power and participatory natural resource management. Camb. J. Econ. 36, 1143–1162. https://doi.org/10.1093/cje/bes034.

Antunes, P., Kallis, G., Videira, N., Santos, R., 2009. Participation and evaluation for sustainable river basin governance. Ecol. Econ. 68, 931–939. https://doi.org/10.

1016/j.ecolecon.2008.12.004.
Arellano-Yanguas, J., 2011. Aggravating the resource curse: decentralisation, mining and conflict in Peru. J. Dev. Stud. 47, 617–638. https://doi.org/10.1080/00220381003706478.
Armijos, M.T., 2005. Mount Quilish: Social Movements, Environmentalism and Development. University of Oxford.
Barnaud, C., Paassen, A.Van, 2013. Equity, power games and legitimacy: dilemmas of participatory natural resource management. Ecol. Soc. 18, 21.
Bebbington, A., Humphreys Bebbington, D., 2011. An andean avatar: post-neoliberal and neoliberal strategies for securing the unobtainable. New Polit. Econ. 16, 131–145. https://doi.org/10.1080/13563461003789803.
Beierle, T.C., Cayford, J., 2002. Democracy in Practice: Public Participation in Environmental Decisions. Resources for the Future, Washington DC.
Berkes, F., Folke, C., 1998. Linking Social and Ecological Systems: Management Practices and Social Mechanisms for Building Resilience. Cambridge University Press, Cambridge.
Berry, K.A., Mollard, E., 2010. Social Participation in Water Governance and Management: Critical and Global Perspectives. EARTHSCAN, London.
Birnbaum, S., Bodin, Ö., Sandström, A., 2015. Tracing the sources of legitimacy: the impact of deliberation in participatory natural resource management. Policy Sci. 48, 443–461. https://doi.org/10.1007/s11077-015-9230-0.
Boelens, R., 2014. Cultural politics and the hydrosocial cycle: water, power and identity in the Andean highlands. Geoforum 57, 234–247. https://doi.org/10.1016/j.geoforum.2013.02.008.
Boelens, R., Hoogesteger, J., Swyngedouw, E., Vos, J., Wester, P., 2016. Hydro-social Territories: a political ecology perspective. Water Int. 41, 1–14. https://doi.org/10.1080/02508060.2016.1134898.
Brody, S., 2003. Measuring the effects of stakeholder participation on the quality of local plan based on the principles of collaborative ecosystem management. J. Plan. Educ. Res. 407–419. https://doi.org/10.1177/0739456X03253022.
Budds, J., 2009. Contested H2O: science, policy and politics in water resources management in Chile. Geoforum 40, 418–430. https://doi.org/10.1016/j.geoforum.2008.12.008.
Cano, A., 2013. ¿« De arriba hacia abajo » o « de abajo hacia arriba »? Participación social, agricultura y minería en la gestión integrada de la cuenca Chancay-Lambayeque. Apuntes XL. pp. 43–76.
Conca, K., Wu, F., Mei, C., 2006. Global regime formation or complex institution building? The principled content of international river agreements. Int. Stud. Q. 50, 263–285. https://doi.org/10.1111/j.1468-2478.2006.00402.x.
Cook, B.R., Spray, C., 2013. The persistence of 'normal' catchment management despite the participatory turn : exploring the power effects of competing frames of reference. Soc. Stud. Sci. 43, 754–779. https://doi.org/10.1177/0306312713478670.
Cooke, B., Kothari, U., 2001. Participation. The New Tyranny? Zed Books, London.
Cornwall, A., Coelho, V.S., 2006. Spaces for Change? The Politics of Citizen Participation in New Democratic Arenas. Zed Books, London.
Crabtree, J., Whitehead, L., 2008. Unresolved Tensions : Bolivia Past and Present. University of Pittsburgh Press, Pittsburgh, Pa, Pittsburgh, Pa.
Cronin, A.E., Ostergren, D.M., 2007. Democracy, participation, and native american tribes in collaborative watershed management. Soc. Nat. Resour. 20, 527–542. https://doi.org/10.1080/08941920701338059.
Damonte Valencia, G.H., 2015. Redefiniendo Territorios Hidrosociales: Control Hídrico En El Valle De Ica, Perú (1993-2013). Cuad. Desarro. Rural 12, 109. https://doi.org/10.11144/Javeriana.cdr12-76.rthc.
Davies, A.L., White, R.M., 2012. Collaboration in natural resource governance: reconciling stakeholder expectations in deer management in Scotland. J. Environ. Manage. 112, 160–169. https://doi.org/10.1016/j.jenvman.2012.07.032.
Davos, C.A., Lajano, R.P., 2001. Analytical perspectives of cooperative coastal management. J. Environ. Manage. 62, 123–130. https://doi.org/10.1006/jema.2001.0427.
De la Cadena, M., 2015. Earth Beings: Ecologies of Practice Across Andean Worlds. Duke University Press, Durham.
Diduck, A., Sinclair, A.J., 2002. Public involvement in environmental assessment: the case of the nonparticipant. Environ. Manage. 29, 578–588. https://doi.org/10.1007/s00267-001-0028-9.
Dryzek, J., 2013. The Politics of the Earth: Environmental Discourses. Oxford University Press, Oxford.
Edelenbos, J., van Buuren, A., van Schie, N., 2011. Co-producing knowledge: joint knowledge production between experts, bureaucrats and stakeholders in Dutch water management projects. Environ. Sci. Policy 14, 675–684. https://doi.org/10.1016/j.envsci.2011.04.004.
Escobar, A., 2018. Designs for the Pluriverse: Radical Interdependence, Autonomy, and the Making of Worlds. Duke University Press, Durham.
Fazey, I., Evely, A.C., Reed, M.S., Stringer, L.C., Kruijsen, J., White, P.C.L., Newsham, A., Jin, L., Cortazzi, M., Phillipson, J., Blackstock, K., Entwistle, N., Sheate, W., Armstrong, F., Blackmore, C., Fazey, J., Ingram, J., Gregson, J., Lowe, P., Morton, S., Trevitt, C., 2013. Knowledge exchange: a review and research agenda for environmental management. Environ. Conserv. 40, 19–36. https://doi.org/10.1017/S037689291200029X.
Fearnside, P.M., 2013. Viewpoint-decision making on amazon dams: politics trumps uncertainty in the madeira river sediments controversy. Water Altern. 6, 313–325.
Few, R., Brown, K., Tompkins, E.L., 2007. Public participation and climate change adaptation: avoiding the illusion of inclusion. Clim. Policy 7, 46–59. https://doi.org/10.1080/14693062.2007.9685637.
Fiorino, D.J., 1990. Citizen participation and environmental risk : a survey of institutional mechanisms. Sci. Technol. Hum. Values 15, 226–243.
Folke, C., Hahn, T., Olsson, P., Norberg, J., 2005. Adaptive governance of social-ecological systems. Annu. Rev. Environ. Resour. 30, 441–473. https://doi.org/10.1146/annurev.energy.30.050504.144511.
Fung, A., 2006. Varieties of participation in complex governance. Public Adm. Rev. 66, 66–75.
Fung, A., Wright, E.O., 2003. Deepening Democracy: Institutional Innovations in Empowered Participatory Governance. Verso, London and New York. https://doi.org/10.1521/siso.2006.70.4.566.
Gerlak, A.K., 2017. Regional water institutions and participation in water governance: The Colorado River delta as an exception to the rule? J. Southwest 59, 184–203.
Gupta, J., 2009. Driving forces in global fresh water governance. In: Huitema, D., Meijerink, S. (Eds.), Water Policy Entrepreneurs. A Research Companion to Water Transitions Around the Globe. Edward Elgar, Cheltenham, pp. 37–60.
Hajer, M.A., 1997. The Politics of Environmental Discourse: Ecological Modernization and the Policy Process. Oxford University Press, Oxford. https://doi.org/10.1093/019829333X.001.0001.
Halbe, J., Pahl-Wostl, C., Sendzimir, J., Adamowski, J., 2013. Towards adaptive and integrated management paradigms to meet the challenges of water governance. Water Sci. Technol. 67, 2651 LP-2660.
Heikkila, T., Gerlak, A.K., 2013. Building a conceptual approach to collective learning: lessons for public policy scholars. Policy Stud. J. 41, 484–512. https://doi.org/10.1111/psj.12026.
Henry, A.D., 2011. Ideology, power, and the structure of policy networks. Policy Stud. J. 39, 361–383. https://doi.org/10.1111/j.1541-0072.2011.00413.x.
Hoogesteger, J., Boelens, R., Baud, M., 2016. Territorial pluralism: water users' multi-scalar struggles against state ordering in Ecuador's highlands. Water Int. 41, 91–106. https://doi.org/10.1080/02508060.2016.1130910.
Huitema, D., 2002. Hazardous Decisions: Hazardous Waste Siting in the UK, The Netherlands and Canada. Institutions and Discourses. Kluwer Academic Publishers, Dordrecht.
Huitema, D., Meijerink, S., 2014. The Politics of River Basin Organisations: Coalitions, Institutional Design Choices and Consequences. Edward Elgar, Cheltenham.
Huitema, D., Meijerink, S., 2017. The generation, diffusion, and impact of innovations in global water governance. J. Southwest 59, 83–105. https://doi.org/10.1353/jsw.2017.0007.
Ingold, K., 2011. network structures within policy processes : coalitions, power, and brokerage in Swiss climate policy. Policy Stud. J. 39, 435–459.
Koontz, T.M., Thomas, C.W., 2006. What do we know and need to know about the environmental outcomes of collaborative management? Public Adm. Rev. 66, 111–121.
Law 9433, 1997. Lei das águas. Política Nacional de Recursos Hídricos. Brazil. http://www.planalto.gov.br/ccivil_03/Leis/L9433.htm.
Lemos, M.C., Bell, A.R., Engle, N.L., Maria, R., Johnsson, F., Nelson, D.R., 2010. Technical knowledge and water resources management : A comparative study of river basin councils, Brazil. Water Resour. 46, 1–12. https://doi.org/10.1029/2009WR007949.
Lubell, M., Lippert, L., 2011. Integrated regional water management: a study of collaboration or water politics-as-usual in California. USA. Int. Rev. Adm. Sci. 77, 76–100. https://doi.org/10.1177/0020852310388367.
Lubell, M., Leach, W., Sabatier, P.A., 2009. Collaborative watershed partnerships in the epoch of sustainability. In: Mazmanian, D., Kraft, M. (Eds.), Toward Sustainable Communities: Transitions and Transformations in Environmental Policy. MIT PRESS, Cambridge, Massachusetts, pp. 255–288.
Lund, J.F., Saito-Jensen, M., 2013. Revisiting the issue of elite capture of participatory initiatives. World Dev. 46, 104–112. https://doi.org/10.1016/j.worlddev.2013.01.028.
Lynch, B., 2009. Can the Technocrats Calm Peru's Troubled Waters? Nacla 47, 70–74.
Lynch, B.D., 2012. Vulnerabilities, competition and rights in a context of climate change toward equitable water governance in Peru's Rio Santa Valley. Glob. Environ. Chang. 22, 364–373. https://doi.org/10.1016/j.gloenvcha.2012.02.002.
Mancilla García, M., 2017. Negotiating in the absence of trust: exploring the interactions between officials and residents in a waste management project in Copacabana, Bolivia. Local Environ. 22 (6), 667–681. https://doi.org/10.1080/13549839.2016.1252319.
Mancilla García, M., Bodin, Ö., 2018. Participation in multiple decision making water governance forums in Brazil enhances actorsí perceived level of influence. Policy Stud. J. 47, 27–51. https://doi.org/10.1111/psj.12297.
Matti, S., Sandström, A., 2011. The rationale determining advocacy coalitions: examining coordination networks and corresponding beliefs. Policy Stud. J. 39, 385–410. https://doi.org/10.1111/j.1541-0072.2011.00414.x.
McGuire, M., 2006. Collaborative Public Managment: assessing what we know and how we know it. Public Adm. Rev. 66, 33–43. https://doi.org/10.1111/j.1540-6210.2006.00664.x.
Mitchell, T., 2002. Rule of Experts: Egypt, Techno-Politics, Modernity. University of California Press, Berkeley.
MMA, Ministério do Meio Ambiente, 2018. Sistema Nacional de Gerenciamento de Recursos Hídricos. Last accessed 04/10/2018. http://www.mma.gov.br/agua/recursos-hidricos/sistema-nacional-de-gerenciamento-de-recursos-hidricos.
Molle, F., 2009a. River-basin planning and management: the social life of a concept. Geoforum 40, 484–494. https://doi.org/10.1016/j.geoforum.2009.03.004.
Molle, F., 2009b. Water, politics and river basin governance: repoliticizing approaches to river basin management. Water Int. 34, 62–70. https://doi.org/10.1080/02508060802677846.
Mollinga, P., 2008. Water, politics and development:\nFraming a political sociology of Water resources management. Water Altern. 1, 7–23.
Newig, J., 2007. Does public participation in environmental decisions lead to improved environmental quality. CCP (Communication, Coop. Particip. Res. Pract. a Sustain. Futur. 1, 51–71.
Newig, J., Fritsch, O., 2009. Environmental governance: participatory, multi-level - and effective? Environ. Policy Gov. 19, 197–214. https://doi.org/10.1002/eet.509.

Newig, J., Challies, E., Jager, N.W., Kochskaemper, E., Adzersen, A., 2017. The environmental performance of participatory and collaborative governance: a framework of causal mechanisms. Policy Stud. J. 00, 1–29. https://doi.org/10.1111/psj.12209.

Olsson, P., Folke, C., Hahn, T., 2004. Social-ecological transformation for ecosystem management: the development of adaptive co-management of a wetland landscape in southern Sweden. Ecol. Soc. 9.

Oré, M.T., Geng, D., 2015. Politicas públicas del agua en el Perú: viscisitudes para la creación del Consejo de Recursos Hídricos de la Cuenca Ica-Huancavelica. Agric. Soc. y Desarro. 12, 409–445.

Ostrom, E., 1990. Governing the Commons: The Evolution of Institutions for Collective Action. Cambridge University Press, Cambridge.

Pahl-Wostl, C., Craps, M., Dewulf, A., Mostert, E., Tabara, D., Taillieu, T., 2007. Social learning and water resources management. Ecol. Soc. 12 https://doi.org/5.

Peirce, C.S., Hartshorne, C., Weiss, P., Burks, A.W., 1994. The Collected Papers of Charles Sanders Peirce. Electronic Edition. InteLex Corporation, Charlottesville.

Pellizzoni, L., 2013. Uncertainty and participatory democracy. Environ. Values 12, 195–224.

Plumwood, V., 1991. Nature, self, and gender : environmental feminism, philosophy, of rationalism and the critique. Hypathia 6, 3–27.

Plumwood, V., 2006. The concept of a cultural landscape: nature, culture and agency in the land. Ethics Sci. Environ. Polit. 11, 115–150. https://doi.org/10.1353/een.2007.0005.

Purdy, J.M., 2012. A framework for assessing power in collaborative governance processes. Public Adm. Rev. 72, 409–417. https://doi.org/10.1111/j.1540-6210.2011.02525.x.

Reed, M.S., 2008. Stakeholder participation for environmental management: a literature review. Biol. Conserv. 141, 2417–2431. https://doi.org/10.1016/j.biocon.2008.07.014.

Renn, O., Webler, T., Wiedemann, P., 1995. Fairness and Competence in Citizen Participation: Evaluating Models for Environmental Discourse. Springer, Dordrecht. https://doi.org/10.1177/00953990022019588.

Safford, T.G., 2010. The political–Technical divide and collaborative management in Brazil's Taquari Basin. J. Egypt. Acadmic Soc. Environ. Dev. 19, 68–90. https://doi.org/10.1177/1070496509355275.

Sandström, A., Crona, B., Bodin, Ö., 2014. Legitimacy in co-management: the impact of preexisting structures, social networks and governance strategies. Environ. Policy Gov. 24, 60–76. https://doi.org/10.1002/eet.1633.

Schmeier, S., Gerlak, A.K., Blumstein, S., 2016. Clearing the muddy waters of shared watercourses governance: conceptualizing international River Basin Organizations. Int. Environ. Agreements Polit. Law Econ. 16, 597–619. https://doi.org/10.1007/s10784-015-9287-4.

Seeman, M., 2015. Water Security, Justice and the Politics of Water Rights in Peru and Bolivia. https://doi.org/10.1017/CBO9781107415324.004.

Smith, G., 2003. Deliberative Democracy and the Environment. Routledge, London.

Smith, G., 2009. Democratic Innovations : Designing Institutions for Citizen Participation. Theories of Institutional Design. Cambridge University Press, Cambridge.

Strang, V., 2013. Going against the flow: the biopolitics of dams and diversions. Worldviews Glob. Relig. Cult. Ecol. 17, 161–173. https://doi.org/10.1163/15685357-01702007.

Swyngedouw, E., 2013. UN water report 2012: depoliticizing water. Dev. Change 44, 823–835. https://doi.org/10.1111/dech.12033.

Tankha, S., Fuller, B., 2010. Getting things done: bureaucratic and entrepreneurial approaches to the practice of participatory water management reforms in Brazil and India. Water Policy 12, 84–103. https://doi.org/10.2166/wp.2010.015.

Tengö, M., Brondizio, E.S., Elmqvist, T., Malmer, P., Spierenburg, M., 2014. Connecting diverse knowledge systems for enhanced ecosystem governance: the multiple evidence base approach. Ambio 43, 579–591. https://doi.org/10.1007/s13280-014-0501-3.

Tengö, M., Hill, R., Malmer, P., Raymond, C.M., Spierenburg, M., Danielsen, F., Elmqvist, T., Folke, C., 2017. Weaving knowledge systems in IPBES, CBD and beyond—lessons learned for sustainability. Curr. Opin. Environ. Sustain. 26–27, 17–25. https://doi.org/10.1016/j.cosust.2016.12.005.

Timmermans, S., Tavory, I., 2012. Theory construction in qualitative research: from grounded theory to abductive analysis. J. Sociol. Theory Relig. 30, 167–186. https://doi.org/10.1177/0735275112457914.

Ulibarri, N., 2015. Tracing process to performance of collaborative governance: a comparative case study of federal hydropower licensing. Policy Stud. J. 43, 283–308. https://doi.org/10.1111/psj.12096.

Webler, T., 1995. "Right" discourse in citizen participation: an evaluative yardstick. In: Renn, O., Webler, T., Wiedemann, P. (Eds.), Fairness and Competence in Citizen Participation: Evaluating Models for Environmental Discourse. Springer, Dordrecht.

Williams, B., Matheny, A., 1995. Democracy, Dialogue, and Environmental Disputes. The Contested Languages of Social Regulation. Yale University Press, New Haven.

Young, J.C., Jordan, A., R Searle, K., Butler, A., S Chapman, D., Simmons, P., Watt, A.D., 2013. Does stakeholder involvement really benefit biodiversity conservation? Biol. Conserv. 158, 359–370. https://doi.org/10.1016/j.biocon.2012.08.018.