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Currents of Water Commons Research: A Review

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ABSTRACT: Since Elinor Ostrom was awarded the Nobel Prize in 2009, research on the commons, and particularly on water commons, has expanded significantly in volume and theoretical diversity. This paper offers a scoping review of 61 'water commons' studies to identify theoretical strands and ways in which water commons are currently operationalised and problematised. First, the review reflects on the evolution of water commons research from the Ostromian – that is, more institutional – approach, towards one that is more critical, relational and social constructivist. The paper shows that recent contributions have the potential for both constituting an inflection point and expanding the Ostromian tradition. Second, the review identifies four interconnected ways of operationalising water commons, that is, as a resource, an organisation, a community and a process. It highlights a shift away from purely resource- and right-centric understandings towards more complex sociopolitical conceptualisations. Also, water commons are predominantly framed as responses to market- and state-driven governance failures, though warnings against romanticisation remind us of their limits in addressing large-scale challenges and internal power asymmetries. The analysis further identifies two major debates – on the role of the state and on the relationship between rights-based approaches and relational commons governance – and two emerging threads concerning commons endurance under external pressures and the ambivalent role of social movements. Overall, the review enriches our understanding of the literature on water commons beyond the 'institutional vs. critical studies' dichotomy, and sheds new light on the diverse ways in which scholars have empirically worked with, and on, water commons.

KEYWORDS: Water, commons, Ostrom, critical theory, commoning, definitions, governance

INTRODUCTION

Since Elinor Ostrom was awarded the 2009 Nobel Prize in Economics, research on the 'commons' has continued to surge. Studies on 'water commons' are no exception, with a Google Scholar search in August 2025 yielding over 800 publications for the 2020 to 2025 period alone. Alongside the growth in the number of contributions, the range of perspectives has also expanded in conceptual and theoretical diversity. Much of what we have learnt about water commons comes from the seminal contribution of

Elinor Ostrom and the Bloomington School of political economy (Aligica, 2005). The work of the Bloomington School for a considerable time pivoted around the works of scholars affiliated with The Vincent and Elinor Ostrom Workshop in Political Theory and Policy Analysis at Indiana University; it has to date produced the most widely accepted knowledge around community-based natural resource management, also known as the institutional theory of the commons (Villamayor-Tomas and García-López, 2021).

The institutional theory of the commons emerged in the 1970s in response to the Hardinian narrative that depicted local users as inevitably destined to overexploit natural resources (Hardin, 1968). This prediction, epitomised by Hardin's 'tragedy of the commons' parable, gained dominant traction in policy circles and international organisations worldwide, despite lacking systematic empirical evidence. By building on long-standing empirical cases of successful community-based natural resource management, institutional theory instead explained the conditions under which local groups of users govern their natural resources sustainably over time (Ostrom, 1990; Cox et al., 2010; Poteete et al., 2010).

Key premises in the institutional theory of the commons are the (1) existence of common-pool resources (CPR), that (2) are exposed to overexploitation or degradation, due to (3) the utility-maximising behaviour of users, who (4) collectively use the resource mostly for economic/livelihood maintenance purposes (Hardin, 1968; Ostrom et al., 1994; Cole et al., 2014). These premises were instrumental in interpreting a vast body of evidence on the resilience of community-based natural resource management regimes over more than five decades and across the globe; this included an abundance of empirical data gathered by Elinor Ostrom and colleagues (Poteete and Ostrom, 2008; Cox et al., 2016).

An important feature of the institutional approach has been the integration of lessons emerging from the water sector with those from other sectors, most notably including the small-scale fishing and forestry sectors (Ostrom, 1990; Ostrom et al., 1994; Schlager et al., 1994; Agrawal, 2001). While originally only interested in the social and institutional aspects and the local scale, the institutional theory has progressively opened up to other factors; these include, most notably, the characteristics of the resources themselves and the larger scale socio-ecological dynamics (in the context of water, see, for example, Blomquist et al., 2004; Meinzen-Dick, 2007; Epstein et al., 2013; Cox, 2014; Fleischman et al., 2014; Villamayor-Tomas et al., 2014; van Rooyen et al., 2020). Key to this evolution has been the use and update of institutional analysis frameworks, including the Institutional Analysis and Development (IAD) framework (Clement, 2010; Schlager and Villamayor-Tomas, 2023), and the Socio-Ecological Systems (SES) framework (Partelow, 2018; Cole et al., 2019); also significant to this opening up have been connections with related theories such as polycentricity (see McGinnis, 1999; Andersson and Ostrom, 2008; Ostrom, 2010; Thiel et al., 2025).

As the institutional theory of the commons became more streamlined over time, the roots of what could be described as 'critical studies of the commons' started to take shape (Villamayor-Tomas and García-López, 2021). Many of these studies and authors were contemporary to the early Bloomington School and provided important insights that were later formalised into the institutional theory (Feeny et al., 1990; Kurien, 1991; Agrawal, 1994). Over time, the influence of critical social science perspectives (including political ecology, critical development studies and agrarian studies) placed questions of power and equity at the centre of critical studies; this made very evident a divide between these and the institutional approach (Villamayor-Tomas and García-López, 2021; Agrawal et al., 2023).

Within the water context, evidence supporting the institutional approach has mostly come from the irrigation sector, including from Martin and Yoder (1988), Ostrom, (1992, 2011), Tang (1992), Benjamin et al. (1994), Meinzen-Dick (1997), Svendsen and Meinzen-Dick (1997), Lam (1998), Bardhan (2000), Meinzen-Dick et al. (2002), Villamayor-Tomas (2014), Dell'Angelo et al. (2014, 2016), Frey et al. (2016), Villamayor-Tomas and García-López (2017). To a lesser extent, it has also come from research on river basins, including that of Blomquist (1992), Saleth and Dinar (2004), Schlager and Blomquist (2008) and Garrick et al. (2016). Yet other support for the institutional approach has come from research focused on

drinking water, such as that by Madrigal-Ballestero and Naranjo (2015), and on inland water systems by, for example, Nagendra and Ostrom (2014). Critical approaches were already present in the early studies of water commons; included here are studies by Coward Jr (1979), Wade (1988), Trawick (2003), and Palerm Viqueira (2008). Today, they constitute a well-known alternative to institutional theory, covering a broad spectrum of rural and urban water problems, governance levels, and theoretical lenses; included here are Zwarteveen (1997), Mollinga (2008), Boelens (2014), Carrozza and Fantini (2016), Mollinga and Veldwisch (2016), Molle et al. (2019), Paerregaard and Andersen (2019), Veldwisch et al. (2019), Vos et al. (2020), Dominguez Guzmán et al. (2023) and Suhardiman et al. (2023).

The surge in publications about the commons that followed Elinor Ostrom's Nobel Prize was unprecedented. This suggests that commons scholarship may be undergoing a significant new inflection point, a suggestion that is further supported by the diversity of contexts in which the concept of 'the commons' is now applied, and the range of ideas that are emerging with regard to what constitutes the commons and their role in society. It is an open question whether and how the new wave of commons research connects with the Ostromian and critical traditions – a question that this paper aims to address. To that end, we review the literature on water commons, recognising water to be a resource with one of the longest-standing traditions in commons research and one in which the recent wave of commons studies has been particularly prominent.

Our research questions are: (1) To what extent do the different theoretical strands within water commons scholarship build on and/or question the institutional theory of the commons 'à la Ostrom'; and (2) What can also be learned about how water commons are problematised by empirically engaging with the literature.

METHODOLOGICAL APPROACH

To answer the first question, we engage in a rather traditional review, that is, one that organises studies and authors as per their theoretical orientations. We take the above-mentioned Ostromian/critical studies distinction as a point of departure and clarify the footprint of the institutional theory of the commons on complementary and alternative theorisations. To answer the second question, we adopt a more empirical approach (Cox et al., 2021) whereby we code the literature on a case-by-case basis to flesh out how the studies operationalise diverse definitions of water commons, and to connect them with governance problems and debates.

Methodologically, the study consists of a scoping review (Munn et al., 2018) that included search, screening, coding and analysis stages. We first searched for papers in SCOPUS using 'water' and 'commons' as keywords. This provided more than 150,000 results, the screening of which was not manageable. Rather than delimiting the search by, for example, time frame or region, we opted to use 'water commons' as a unique search term in the title, abstract and keywords of studies. This search, performed in October 2024, provided 170 results, a number that we considered appropriate given our interest in offering a first preliminary exploration of the literature. The screening excluded articles that were clearly unrelated to the commons or to water (as, for example, articles that mentioned commons as part of a commons copyright license). As a result of this process, we coded 35 papers. We then screened the reference lists of the coded papers in search of articles that mentioned 'water' and 'commons' in their titles, which we added for a total of 61 papers, most of which were published in or after 2015. The coding of information included four blocks of open-ended questions that covered theoretical strands, operational definitions of the commons, governance problems and solutions around the commons, and debates.

Although literature reviews such as this one often translate into quantitative (for example, frequency) analyses, we opted for a more qualitative, reflective analysis. The coding helped us organise information for assimilation, synthesis and reframing, rather than to build a database. While we recognise the limitations of a search that is focused only on 'water commons' (many studies address water commons

without using the term), our interest was precisely on studies that explicitly employ that term, taking them to be specific examples of the new wave of 'commons' studies.

This is not the first attempt to map scholarship on the commons; the above-mentioned distinction between Hardinian, Ostromian and critical perspectives is well established in the literature (Villamayor-Tomas and García-López, 2021). Previous scholars, including also a few covered in this study, have offered their own syntheses. Belotti (2015) distinguishes juridical, management and sociopolitical perspectives on the commons; that author puts distinct emphasis on, respectively, public interest, cooperation and social capital. Similarly, Mosse (1997) contrasts the economic perspective – epitomised in institutional economics and its focus on collective action problems and rules – to an anthropological perspective that is more centred around social power and culture. Obeng-Odoom (2018) and Hofstetter et al. (2023a) offer an overview of the commons programme over time which distinguishes three conceptualisations chronologically: (1) an understanding dominated by the tragedy of the commons framing (Hardin, 1968), whereby commons were studied as open access resources that risk overuse by resource user groups; (2) a conceptualisation of the commons as common property regimes that local user groups design to cope with resource overuse (Ostrom, 1990; Poteete et al., 2010); and (3) an understanding where the concept of the commons is no longer anchored in its 'tragedy', but rather in the process whereby groups of people with shared values self-organise around a more or less explicit interest in promoting the commons as an alternative to privatisation and government.

The synthesis conducted in this review echoes the above classifications and builds further on them, with a particular focus on the narrative that separates the Ostromian perspective from new, alternative ways of studying and practicing (water) commons. At the same time, we recognise the risk that such a narrative promotes a 'siloed' understanding of the scholarship and/or prevents new ways of looking at it. That is why we also revise that narrative critically and examine the literature from a more 'empirical' standpoint, that is, one that focuses on how authors operationalise the study of the commons.

The review has four parts. The first part addresses our first research question by offering an overview of theoretical strands. The second, third and fourth parts address the second research question, providing an overview of operational definitions, governance problems and emerging debates. In the discussion section, we reflect on the influence of the Ostromian tradition on water commons studies, the value of conceptual clarity in commons research, and the potential of the commons as a solution to water problems.

IDENTIFYING THE STREAMS

The scholarship reviewed in this paper exhibits considerable theoretical pluralism; nevertheless, references to Elinor Ostrom and the institutional theory of the commons remain particularly prominent in terms of authors who cite, apply and revise it. Among the revisionist strands, power-centred critical studies are especially prevalent. In our view, however, these studies do not represent a radical break from the institutional approach; rather, they provide a complementary perspective. By contrast, more contemporary relational and social constructivist approaches mark substantial departures, as they challenge several of the core assumptions of the institutional approach. Finally, the review also highlights noteworthy efforts to integrate insights across these different strands of scholarship.

On the imprint of institutional theory

The institutional theory of the commons, and Ostrom in particular, are widely credited with having opened up a new research field around community-based water management (Belotti, 2015; Anderson et al., 2016; Clark, 2017; Zhang, 2019; Dupuits et al., 2020; Zulfiqar et al., 2021; Hofstetter et al., 2023b; Luo and He, 2023; O'Donnell et al., 2024); they are also credited for popularising the 'third way' as an alternative to state and market governance (see Belotti, 2015; Perrotti et al., 2020). Appreciation for such a contribution comes both from institutional and critical scholars. As put by Beloti (2015: 652), "In order

to go beyond the binary logic of public/private management, Ostrom (1990) proposed a third way: the cooperation. With Ostrom, the commons have become a keyword in the international debate".

Authors mention and/or build on different tools of the Ostromian corpus, illustrating its wide imprint on the scholarship. Those tools range from the conceptualisation of water commons as common-pool resources (Berg, 2014; Yu et al., 2016; Meinzen-Dick et al., 2018) and therefore subject to cooperation challenges (Mosse, 1997; Fabricius and Collins, 2007; Obeng-Odoom, 2018), to the use of polycentricity (Frimpong Boamah, 2018) and the 'design principles' theories (Woelfle-Erskine, 2015; Zulfiqar et al., 2021; Pipan et al., 2023), or the IAD and SES frameworks (Sarker et al., 2014; Perrotti et al., 2020; Pipan et al., 2023).

A few studies stand out for their nuanced and expanded treatment of institutional theory on its own terms. Meinzen-Dick and Bakker's (1999) study of Sri Lanka's Kirindi Oya irrigation commons, for example, extends traditional CPR analysis by treating irrigation systems as 'multiple-use commons'. Water is used not only for paddy cultivation, but also for domestic purposes, homestead gardens, livestock and fishing. As they conclude, "developing platforms that accommodate different user groups remains a major challenge for improving the overall productivity, as well as equity, of water use" (ibid: 281). Pipan et al. (2023) add nuance to Ostrom's design principles theory by showing that the performance of drinking water cooperatives in Slovenia owed its success to its self-organisation capacity as well as to the integration of the cooperatives with other non-water-related local associations and broader social networks. Together, they nurtured a sense of community around local management that transcended the provision of specific services. Similarly, Woelfle-Erskine (2015) highlights how community participation in groundwater management in Sonoma, California, in the US, not only made ecological linkages between water quality and salmon populations evident to the users but also generated a new collective understanding of the boundaries of the water commons, that is, as also encompassing salmon fisheries.

Moving beyond Ostromian core assumptions? Power-centred critical studies

As hinted in the introduction, a well-known and long-standing critique of the institutional theory of the commons concerns its inattention to power and the politics of natural resource management, which manifest both in inequalities within communities and distributional injustices that are produced by governments and other external actors.

Many articles in this review take on that critique. In the irrigation context, they highlight how community-based management and decentralisation without attention to power fails to produce inclusion. By allocating water according to land size and monetised access, rather than past collective labour, new government-promoted arrangements in the Ecuadorian Highland irrigation systems erased historical contributions and moral economies of water (Hoogesteger, 2015). In Maharashtra, India, decentralisation reforms redefined what counts as legal use of water, marginalising relational, subsistence and ecological values. As a consequence, dominant-caste farmers with historical irrigation rights and strong political networks ended up capturing disproportionate benefits, while fishers, landless users, women and marginalised caste groups remained structurally disadvantaged (Mahajan and Rajankar, 2024). In New Mexico, US, early legal recognition of traditional irrigation systems reinforced communal authority and political power; however, incremental legal changes later reshaped incentives and facilitated the rise of alternative, enterprise-like farmers and irrigation organisations. This gradually shifted political coalitions and weakened acequia-based governance (Hoogesteger, 2015). Across South Asia, water commons institutions are deeply intertwined with land tenure, which is overwhelmingly male-dominated. Thus, when devolved to local user organisations, irrigation management structures often restrict membership to landowners or household heads, which typically excludes women (Zwarteveen and Meinzen-Dick, 2001).

In the urban context, the articles demonstrate how expanding cities in both the Global South and Global North are transforming agricultural landscapes around freshwater lakes. Collective action is made challenging by changes in regulations around land and water management and by the transformed social demography that follows rapid urbanisation. This has resulted in weakened protection of these urban commons, which adversely impacts water availability for local citizens and the livelihoods of those who traditionally depend on the lakes (D'Souza and Nagendra, 2011; Nagendra and Ostrom, 2014; de Alarcón, 2020; Parikh, 2021; Sen et al., 2021; Meshkani, 2023). In India, the rezoning of wetland commons as public land has meant their progressive urbanisation and transfer to private developers (Nagendra and Ostrom, 2014; Parikh, 2021). Women usually bear the heaviest burden of enclosure, as their work relies on communal and semi-informal spaces. They face a greater burden of labour, household pressures and social responsibilities, often without recognition or any increase in decision-making power (Parikh, 2021).

As mentioned, the above critical studies constitute a good portion of the literature that was reviewed. Overall, however, it is unclear whether they represent a deep critique of the core assumptions of institutional theory, if we understand those to be rational choice and methodological individualism (Aligica and Boettke, 2009). Many of the studies are keen to analyse the distribution of costs and benefits as they emerge from the decisions of individuals and/or organisations and are shaped by institutions and other factors. While gender, class, caste and ethnicity are used to illustrate inequalities, neither these categories, nor the way they are studied, are necessarily problematised.

The relational approach: An inflection point?

In this review, studies on commoning illustrate the relational approach to the commons. They stand out for putting the focus on the process and practices of community building, and for questioning both the common-pool resource understanding of the commons and the primacy of institutions. As put by Lyne (2020: 744),

> commoning involves the establishment of protocols through which access to a resource becomes shared and widespread and where benefit is distributed across a community that has an active role in managing and caring for it. By this description, all kinds of property can be commoned. The actual resource is not of foremost concern; it is instead the process of commoning that really counts.

That said, the articles are quite heterogeneous in terms of the theories they rely on and their understanding of commoning (see the section on definitions below). In his study of local drinking water kiosks in Cambodia, for example, Lyne (2020) uses commoning to explain the process through which the selling of bottled water became shared and the costs and benefits of managing it were distributed across the community. For this purpose, he builds on Gibson-Graham et al.'s (2017) community economies paradigm, which puts the emphasis on the economy as diverse, ethical and collectively shaped, rather than dominated by capitalism alone. Geagea and De Tullio (2024) argue that the institutionalisation and technification of citizen participation in the aftermath of the water re-municipalisation in Naples, Italy, undermined commoning. In that context, the term was understood as the reproduction of embodied knowledge(s), experiences and practices of collective management. For this purpose, the authors build on and contribute to feminist political ecology theories of 'embodiment' that put the emphasis on the situated, and sometimes also physical, significance that these knowledges and experiences have for water users. Bellotti (2015), in her review of the Italian referendum in favour of the 'water common good', refers to the theory of the multitude (Hardt and Negri, 2001) to connect "commoning actions" with democracy. As Bellotti puts it (2015: 654),

> Commoning actions seem to go up, almost following concentric circles, from the co-responsible protection and management of assets (concrete common goods) until the project for governing the collective life, facilitating the deliberation on a shared framework of values (abstract common good) (…). Thus, the common good is well anchored to the will of those who participate in this process, not

only through the vote but also by intervening in the decision-making processes that affect those resources which allow exercising fundamental rights.

Hofstetter et al. (2023b), in turn, build on convivial theory to shed light on the practices of commoning that allow members of Swiss water user associations to interact autonomously and creatively. These include water-sharing practices, customary assemblies, and the mobilising of experiential knowledge. As argued, these practices allow the associations to resist and reshape top-down technocratic and neoliberal reforms on the ground.

The diversity of theories mobilised in commoning studies illustrates the flourishing momentum of this new paradigm; however, it also makes it difficult to assess whether the new paradigm truly constitutes an inflection point in commons scholarship. It remains unclear whether the notion of relationality constitutes sufficient grounding, on its own, for a relatively coherent body of theory to emerge, or whether and how the idea of practices radically departs from broad understandings of institutions (Hodgson, 2006).

A giant awakes? Mobilising the social constructivist approach

A longer-standing departure from the Ostromian tradition are the studies that problematise its realist, resource-oriented approach to the commons and focus on how communities mobilise different social constructions about them.

Studies that highlight water commons resistances against enclosure, depoliticisation, technocratic governance and extractivist development rely quite substantively on the social constructivist approach. Each of these studies highlights different forms of resistance; they include everyday practices (Anderson et al., 2016; Hofstetter et al., 2023b), rights-based and solidarity-driven alternatives (Perera, 2015; Schroering, 2021), local environmental justice protests (Baruah, 2017), and broader transformative socio-environmental movements (Torres-Salinas and Alvez Marin, 2023). They all converge, however, in showing how water commons constitute productive political spaces and discourses through which communities contest power, reassert collective rights and values, and imagine alternative futures of water governance. In Montana, in the US, commons proponents participating in a water planning process were able to advance principles such as collectivism and equality by embedding them within the discursive framework of the prior appropriation system, despite its limited compatibility with such values (Anderson et al., 2016). In Chile, in one of the most extreme cases of water privatisation globally, social and Indigenous movements successfully advanced a commons-based framing of water as a collective right within constitutional debates, and the water commons agenda persisted even after the defeat of the proposed new constitution (Torres-Salinas and Alvez Marin, 2023).

Another example is the studies that focus on the place-based situated knowledge, socionatures, and plural epistemologies that co-constitute the water commons. Torres et al. (2023) build on the 'assemblages' approach in order to understand the emergence of community desalination plants in Chile as alternatives to state and corporate desalination solutions. As illustrated in the analysis, "an archaeology of hydrosocial assemblages requires constructing multiple narratives that relate material practices, representational visions, and symbolic expressions" (Swyngedouw, 2015, cited in Torres et al., 2023: 662). Instead of treating desalination plants as neutral technical fixes to water scarcity, the assemblage lens shows that such water commons are part rights-based grassroots initiative, part coastal ecologies, part NGO-supported innovation, and part state-regulated infrastructure. To analyse water and fish conservation in Montana, Woelfle-Erskine (2015) refers to entanglement theory and an agential realist approach; according to these, the natural and the social are not just connected but come to matter in relation to one another. As argued by the author, "[such] an agential realist approach helps explain why practicing frequent spring monitoring and maintenance might lead a resident to describe their water systems as containing human, manufactured, plant, animal, mineral, and atmospheric elements" (ibid: 740). In citing Vos et al. (2020), Hofstetter et al. (2023a: 3) suggest an alternative "rooted water

collectives" framework for studying the water commons; this allows for an observation of, "the plurality of ontological understandings, epistemological perspectives, worldviews, and values, including the disputes among discourses and multiple languages of valuation". It is this framework that allows them to unveil the different value systems underlying conflicts within and across scales of water governance.

Sticking to Ostrom, but not quite: Integration efforts

This review also reveals studies that, in our view, operate at the interface of the institutional approach, critical studies, and/or constructivist approach. Many of the studies cited above in the section on 'power-centred critical studies' are good illustrations of the tight connections between institutions and distributional issues. They illustrate a recent and broader trend to integrate institutions and power in the study of commons (Dell'Angelo et al., 2017, 2021; Bennett et al., 2018; Velicu and García-López, 2018; Kashwan et al., 2019; Epstein et al., 2020).

A few studies explicitly integrate institutional analysis tools with the study of power and politics. By applying the SES framework to water commons in Bangalore, Nagendra and Ostrom (2014) show how the ecological restoration of urban lakes reinforces socio-environmental injustices. Their study illustrates how only wealthier groups with strong self-organisation and 'networking' capacity can navigate the bureaucracy, given the city's fragmented and opaque governance. Poorer and less well-organised groups remain the most exposed to pollution and the least empowered in decision-making processes. In Ecuador, similarly, Hoogesteger (2015) diagnoses how changes in the imposition of bureaucratic normative structures by the government on the Píllaro North Canal irrigation system generated conflict by undermining locally embedded norms. The key innovation of that paper is its identification and analysis of communal, organisational and state-imposed *norms* (as opposed to just rules), within the governance component of the SES framework.

A few studies bridge institutional analysis and the social constructivist approach through the use of bricolage theory. They unveil the process by which actors reinterpret institutions by piecing together elements of existing norms, rules, relationships and practices, rather than adopting formally designed governance models as intended. Venot (2014) uses bricolage theory to reveal how formal community-based management models of small dam and irrigation systems in Burkina Faso and Ghana rarely function as designed. The author illustrates how, instead, water is accessed and control emerges through the recombination of customary authorities, local power hierarchies, state interventions and everyday practices. In the context of hill irrigation systems in Nepal, farmers respond to changing economic and livelihood pressures not by abandoning collective water management but by selectively recombining elements of traditional collective norms and new individual rights arrangements, creating hybrid governance practices that better fit diversified agricultural needs (Berg, 2014).

In summary, the identification of theoretical strands does not do justice to the diversity of water commons contributions that have emerged over the years. This is of particular relevance when paying attention to the various works that do not entirely question the core assumptions of the Ostromian approach, or that put it in dialogue with other theoretical approaches. In the following three sections we adopt a more empirical, less theory-grounded strategy to the review, that is, one that focuses on operational definitions of water commons alongside the problems and solutions and the debates associated with them.

OVERLAPPING DEFINITIONS OF WATER COMMONS

Across the reviewed literature, operational definitions of water commons rarely stand alone as discrete formulations; rather, they selectively emphasise different dimensions of what constitutes a commons arrangement. We have identified four recurring dimensions: resource, organisation, community and process (see also De Angelis, 2017, for a triadic formulation of goods, communities and processes).

Articles differ less in whether they acknowledge these dimensions than in which they foreground and how they articulate their interrelations.

The resource dimension: Water as shared materiality

A first cluster of studies conceptualises water commons primarily through the resource lens. Here, water is treated as a shared natural resource whose biophysical characteristics (non-excludability, rivalry and vulnerability to depletion) generate collective action dilemmas (Giordano et al., 2014; Sarker et al., 2014; Woelfle-Erskine, 2015; Meinzen-Dick et al., 2018; Zulfiqar et al., 2021; Luo et al., 2022; Luo and He, 2023). Within this framing, 'water commons' denotes a type of resource that requires collective governance to prevent degradation.

In some accounts, this resource orientation remains primarily institutional and managerial. In others, it acquires a normative dimension, particularly when mobilised against privatisation and commodification (Baruah, 2017; Sen et al., 2021). The shared character of water is taken to imply equal or inalienable access. As cited in Lyne (2020), Perera (2015: 732) argues that, "the commons infer inalienable access to it, alongside a 'focus on citizen participation' in managing it as a resource". Here, the resource dimension becomes foundational to arguments about the human right to water.

A second set of contributions complicates a purely biophysical understanding by emphasising water's socially constructed and culturally embedded nature. Zhang (2019: 8) defines water as, "an integrated commons which combines the dimensions of a physical resource system, cultural belonging and worship, and human welfare". Other authors extend the resource lens to include infrastructure systems (Baron and Maillefert, 2021) or frame water as an element of nature over which the state has custodial duties towards present and future generations (Torres et al., 2023).

The organisational dimension: Collective governance arrangements

Many studies define water commons primarily through organisational arrangements; here, the commons is identified less by the characteristics of the resource than by forms of collective management. These range from formal entities such as water districts (Frimpong Boamah, 2018), water user associations and federations (Dupuits et al., 2020), and cooperatives (Pipan et al., 2023), to broader notions such as community-led supply systems (Schroering, 2021).

What unites these approaches is the presence of community-level organising of water management within a particular jurisdiction. Some accounts adopt an institutionalist lens; others emphasise relational and political dynamics (that is, the community dimension). Parikh (2021: 274), for instance, describes such arrangements as a, "structure of power wherein a community regulates access to resources". These arrangements are mediated by social relations and intertwined with livelihoods (Parikh, 2021; O'Donnell et al., 2024). Elsewhere, commons-based organisation is characterised as, "either convivial or only a variant of globalized sameness" (Groenemeyer, 2015, cited in Hofstetter et al., 2023a: 277), underscoring the unique relational (that is, convivial) features of the commons.

The community dimension: Shared identity and mutual dependence

The community dimension rarely appears in isolation, but frequently accompanies organisational and process-oriented definitions. When foregrounded, it shifts attention from formal governance structures to the collective subjects who enact and sustain them.

Water commons are here associated with "common purpose" (McDonald, 2019), "shared values" (Belotti, 2015), "embodied participation" (Geagea and De Tullio, 2024), "identity" (Hofstetter et al., 2023b), "symbolic meanings" (Meshkani, 2023), or "shared use" (Baron and Maillefert, 2021). Drawing on Boelens (2015), Hofstetter et al. (2023b: 6) define water commons as,

> a group of internally differentiated water users bound by mutual dependence to develop, use and manage their water sources, by a sense of collective (culture-space bound) hydraulic identity, and who are determined to realize their interdependence and materialize their collective and individual water rights by engaging in collective action strategies (…) through messy and power-charged processes.

Such formulations highlight that commons governance depends not only on institutional rules but also on shared identity, mutual dependence and recognition of power asymmetries.

The process dimension: Commoning as collective action

The fourth and increasingly prominent dimension of water commons conceptualises them as a process, often articulated through the notion of commoning. Here, the commons is understood as collective action in the making.

As hinted in the previous section, commoning is described in rather diverse ways, including as organising, social practices and learning (McDonald, 2019; Meshkani, 2023), as open and inclusive decision-making (Fattori, 2013), as social reproduction (Fattori, 2013; Geagea and De Tullio, 2024) and as mobilisation or resistance to commodification and reappropriation (Belotti, 2015; Anderson et al., 2016; Geagea and De Tullio, 2024). A recurring insight is that, "resources become part of the commons, and not the other way around" (McDonald 2019: 72), which underscores the primacy of collective agency.

Several authors explicitly integrate the dimensions of resource, community and process. Baron and Maillefert (2021: 135) conceptualise territorialised water commons as, "structured around three components: governance, uses and infrastructures (…). Commons building is in turn characterized by complex relationships among the three components. This complexity can be tackled through the study of conflicts, which represent inflection points in the processes of commons building". Fattori (2013) and Belotti (2015) similarly articulate triadic understandings that link common goods, commoners and commoning; this emphasises the centrality of participatory self-government and care. Across all these contributions, the commons is not a static arrangement; rather, it is an ongoing and sometimes conflictual process, whether internally among participants (Anderson et al., 2016; Baron and Maillefert, 2021; Hofstetter et al., 2023b) or in relation to state authorities (Geagea and De Tullio, 2024; Meshkani, 2023).

In summary, tensions between the different definitions arise around ontology (whether water is inherently a commons or becomes one through practice), normativity (property regime versus political claim) and conflict (harmonious self-governance versus power-laden struggle). Across perspectives, however, a shared intuition persists, which is that water commons are constituted through the interplay of material resources, institutionalised organisation, shared identity and ongoing processes of commoning.

GOVERNANCE PROBLEMS AND SOLUTIONS

The reviewed literature spans both rural and urban settings and covers a wide range of water uses including drinking water, irrigation, recreation, fishing and energy generation. While rural contexts such as irrigation are strongly represented, urban cases are equally prominent, especially in relation to drinking water provision, recreation and fishing. While the literature is geographically diverse and covers multiple water uses, some patterns emerge in the governance problems examined and the solutions proposed. These patterns cluster around market governance, state governance, and commons governance itself.

Market governance: Privatisation, commodification and marginalisation

A recurring concern in both rural and urban contexts is the expansion of market governance, which is mostly understood as the privatisation of water use rights or water services. Studies associate

privatisation with reduced access, increased marginalisation and democratic deficits (Perera, 2015; Schroering, 2021; Torres et al., 2023; Torres-Salinas and Alvez Marin, 2023). In these accounts, commodification transforms water from a collectively governed resource into a tradable asset, thereby exacerbating inequalities.

Beyond formal privatisation, markets are also linked to broader environmental and social harms including plastic bottle pollution and the erosion of participatory accountability mechanisms (Schroering, 2021). In response, authors frequently emphasise social mobilisation as a corrective force – whether to defend the human right to water, to formalise community-based rights in statutory law, or to contest exclusionary property regimes (Schroering, 2021; Torres-Salinas and Alvez Marin, 2023).

Proposed alternatives tend to foreground community-based initiatives including community-led desalination projects (Torres et al., 2023), gift-economy-based water vending practices (Obeng-Odoom, 2018), or enhanced citizen participation within public management structures (Fattori, 2013). While these differ institutionally, they share an attempt to re-embed water governance within collective social relations rather than market exchange.

State governance: Top-down imposition and institutional displacement

A second cluster of problems concerns state governance, particularly when characterised by centralised or top-down decision-making. Here, critiques focus on the social and ecological consequences of imposed development projects and regulatory regimes. Examples include the community impacts of hydropower development (Baruah, 2017) and the undermining of local institutions, knowledges and livelihoods (Hofstetter et al., 2023a, 2023b; Sen et al., 2021).

In these accounts, the issue is not the presence of the state per se, but rather the displacement of locally rooted governance systems and knowledge. Proposed responses closely mirror those advanced in critiques of market governance, that is, recognition of place-based knowledges and collective visions, or imaginaries (Hofstetter et al., 2023a, 2023b), as well as more inclusive and participatory decision-making processes (Sen et al., 2021). The emphasis thus shifts from centralised imposition towards collaborative and context-sensitive governance arrangements.

Challenges within commons governance: Scale, coordination and internal tensions

A significant subset of contributions addresses challenges emerging within commons governance itself, particularly in rural contexts. These include tragedy-of-the-commons-type situations, where collective management fails to prevent overuse or degradation (Sarker et al., 2014; Meinzen-Dick et al., 2018; Luo and He, 2023). Other concerns revolve around scale mismatches, that is, the limited capacity of local community-based solutions to address large-scale sanitation or infrastructural problems (McDonald, 2019), and the risk that transnational environmental justice movements may homogenise diverse local discourses (Dupuits et al., 2020).

The solutions proposed are varied. Some authors advocate for state intervention or state-supported common property regimes to stabilise collective arrangements (McDonald, 2019; Sarker et al., 2014). Others emphasise the reinforcement of shared mental models, trust and justice-oriented norms within communities (Meinzen-Dick et al., 2018; Luo and He, 2023). At larger scales, commons movements are conceptualised as capable of balancing mobilisation and institutional reproduction across levels (Dupuits et al., 2020). In all these accounts, commons governance is neither romanticised nor rejected; rather, it is treated as contingent and in need of institutional and scalar support. None of the authors, however, shed light on the facilitating role of national and international NGOs, despite the long-standing literature about it in the irrigation context (Uphoff, 1986; Meinzen-Dick, 1997; Garces-Restrepo et al., 2007).

LONG-STANDING AND EMERGING DEBATES

The review also reveals two transversal debates, among possibly others, that may be worth following up on in the future.

On the role of the state

The first of the debates centres on the tension between state and community management. This debate can be traced back to Wittfogel's (1959) hydraulic theory, which claimed that societies dependent on extensive water infrastructure such as canals, dams, flood control and irrigation works required strong bureaucratic coordination. The institutional theory of the commons emerged partially in response to Wittfogel's predictions and was built on the growing evidence about the failure of centralised state management of water and other natural resources (Ostrom et al., 1994). Over time, the debate was progressively replaced by an interest in hybrid modes of governance, that is, the conditions under which governments and communities can work together to manage water and other resources (Frey et al., 2016; Molle and Closas, 2020; Villamayor-Tomas et al., 2022).

Some of the papers reviewed here remind us that the state management vs. community-based management debate is far from settled in the context of highly centralised and/or authoritarian countries. If certain conditions are met, water commons can thrive under strong, interventionist governments like the Chinese. The Chinese political philosophy of *Gōnggòng* and the country's history of state formation illustrate that the "sharing-in-common feature of water governance mandates and legitimizes public authority, which in turn serves the common interest" (Zhang, 2019: 8). This, and the observation that water policy-making in China is more polycentric and adaptive than expected, offers an opportunity to reconsider the interventionist role of governments in managing the commons (Zhang, 2019). Locally, Yu et al. (2016) illustrate how strong governments such as the Chinese can coexist with some of Ostrom's design principles in irrigation commons provided that social capital among farmers is strong and there is a shared notion of distributional, procedural and recognitional justice. Luo et al. (2022), in turn, show that in some contexts, such as that of wastewater control and treatment in rural areas, local governments alone may be more desirable than commons regimes, particularly if households do not have previous experience with self-organisation and if domestic wastewater treatment is not perceived as a community affair. Drawing on Japan's irrigation water management experience, Sarker (2013) also argues in favour of such a "state-reinforced self-governance model". A strong government need not be a coercive force that compels users to communicate and manage the commons, nor need such a government stay away from local user groups as they self-organise. As long as local decision-making is respected, governments can have a strong interventionist role; they can provide financial, technological, statutory and political support that enhances user autonomy and thereby reinforces users' ability to self-organise.

In the urban context, analyses are a bit less optimistic. Geagea and De Tullio (2024) raise the issue of whether urban water re-municipalisation is a promising way to build water commons (that is, water managed for and by the community) or whether it is the opposite. In the Naples case, the transformative potential of legal-political and branding changes of the new water utility was limited by a subsequent technical and administrative reformulation that limited knowledge and participation inclusiveness. McDonald (2019) shows a similar concern, but with other nuances. In re-municipalisation processes inspired by 'autocratic state capitalism' or 'market managerialism', the risk of water commons suppression or co-optation is higher than in reforms inspired by 'social democratic' or 'anti-capitalist' principles. There is a potential for non-state, non-technocratic, commons-inspired water partnerships, but "a growing fetishization of 'communitization' in the commons literature shifts our attention away from the necessity of rebuilding and democratizing state apparatuses" (McDonald, 2019: 73). More importantly, the scale of certain water problems may just require state intervention and control. For instance, "sanitation provision in a city of several million people requires massive infrastructural

investment and engineering know-how which no amount of community collaboration could possibly hope to achieve on a metropolitan scale (and for which there is no actual precedent)" (ibid: 73).

Right to water and relationality

A new debate has also emerged between the rights and relational approaches to water. This debate is both ontological and political. Ontologically, it reflects disquisitions around what constitutes the commons and whether rights and infrastructure are critical for them to thrive. The institutional theory of the commons is a theory of common property regimes and how they articulate self-organisation efforts by local resource user groups. Critical and commoning theories question the importance of rights. Community rights cannot be said to constitute commons when communities lack effective control over water resources in the face of government policies or encroachment by large extractive industries (Hoogesteger, 2015), or when communities meet their needs without holding formal rights (Torres et al., 2023; Obeng-Odoom, 2018).

More explicit is the political debate around the human right to water (HRW) and the commons. As pointed out by O'Donnell (2024), the language of 'rights' defined water as commons since at least the early Roman law but has since then evolved to embrace a wider diversity of private property rights, human rights, and rights of nature/rivers. These do not necessarily align with, and may jeopardise, the relational nature of collective management of, for instance, long-standing customary water management systems. The human right to water has been mobilised in countries like Chile and Italy to counteract water privatisation (Torres et al., 2023) and promote a more relational approach to water management through participation. To quote O'Donnell et al. (2024), however, the human right to water, in this sense, "individualizes water service provision and can obscure the collective rights we share. As rivers gain rights, this can be a way to merely insert them into existing rights-based water law frameworks, rather than challenging the foundation of those frameworks". Ultimately, "whether the legal protection of a human right to water can help to facilitate this commons-based, relational understanding of water or is more appropriately understood as a barrier depends on the meaning ascribed to human rights themselves" (ibid: 22).

The most optimistic accounts argue that the HRW can reinforce commons-based governance when it is enacted through collective struggle and embedded in community institutions. In Colombia, communities used the constitutional recognition of 'water as a fundamental right' to defend their local aqueducts against privatisation reforms; they also mobilised 'rights' language to legitimise long-standing practices of collective labour, democratic assemblies and non-profit service provision (Perera, 2015). Grassroots movements in Detroit and Ireland also demonstrate how communities facing water shut-offs, austerity measures and proposed commodification mobilised the human right to water as a solidarity-based political claim. In both cases, the HRW functioned not as a technocratic minimum guarantee but as a mobilising discourse that strengthened collective resistance and democratic participation (Schroering, 2021). For this to happen, HRW must be reframed through a commons-based approach that is attentive to caste hierarchies, gendered labour burdens and climate vulnerability, so that the right to water has embedded in it the principles of collective stewardship and distributive justice (Ohdedar, 2019).

The more sceptical authors question whether HRW, as it is institutionalised in practice, can meaningfully advance commons-based governance. In many cases across the Global South, HRW has been framed primarily as a guarantee of minimum individual access, which allows it to coexist with cost-recovery policies, private sector participation and commodified provision (Bakker, 2007). In South Africa, for example, the constitutional recognition of socio-economic rights did not prevent the implementation of prepaid water meters and water policies that were structured around minimal allocations and which reinforced a technocratic model of service delivery rather than democratic control over water systems. In this sense, HRW may mitigate extreme deprivation without transforming underlying property regimes

or market logics. HRW has been progressively 'deradicalised' through its incorporation into international development frameworks that emphasise affordability benchmarks and infrastructure expansion rather than collective governance or decommodification (Clark, 2017). Overall, the institutional trajectory of HRW demonstrates its vulnerability to co-optation, which limits its capacity to sustain genuine water commons.

Between the optimistic and pessimistic poles, Koumparou (2018) emphasises that HRW and water commons rest on different normative foundations and compatibility is therefore contingent on careful institutional design. Ensuring HRW in rural contexts may require hybrid arrangements that combine state guarantees, regulated markets and community management, rather than relying on any single governance model. Lyne's (2020) example of water vending kiosks in rural Cambodia shows how, even when market-based mechanisms are used, careful design and local embeddedness can allow rights-based frameworks to coexist with commons principles, which then protects participatory governance, equitable access and social objectives.

On endurance and social movements

Two other threads that are interesting – even if they are not fully developed as debates – relate to the endurance of water commons and the role of social movements. The question of the endurance of the commons was foundational to early institutional theory across the irrigation, fishery and forest contexts, and critical studies provide new salience to the question. The main threat to water commons is not overexploitation – as it is framed in the 'tragedy of the commons' – but rather the risk that rights and services will be privatised without apparent reason (Geagea and De Tullio, 2024), that the state will take over irrigation institutions, or that urban development will engulf urban lake commons (Parikh, 2021; Sen et al., 2021; Hofstetter et al., 2023a).

Social movements can both defend and enhance the commons, but they can also undermine them (Villamayor-Tomas and García-López, 2021). As discussed above, movements can operationalise the human rights discourse to bring both practical and radical demands to the state (Clark, 2017), while working within (and with) the legal context. At the same time, various water commons movements in Latin America illustrate how the simplification of the discourses around HRW and/or the cultural ecosystem services that are used by the movements may lead to the undermining of local grievances or minority rights. This may, in turn, "exacerbate pre-existing local battlefields related to water rights allocation, power distribution among communities, and the diversity of water uses" (Dupuits et al., 2020: 2). The process of social mobilisation around HRW can itself reinforce divisions within water commons regimes, as occurred in the Yaqui, Mexico, irrigation community struggles against a government-promoted water transfer (Villamayor-Tomas et al., 2020).

DISCUSSION

This paper explores the landscape of water commons research, reviewing both its theoretical foundations and its expanding conceptual boundaries and applications. Several discussion themes emerge out of the review: (1) the persistent imprint of Ostrom and institutional theory; (2) the ongoing struggle for conceptual clarity; and (3) the question of whether the commons can meaningfully contribute to addressing contemporary water-related socio-ecological crises.

The footprint of Ostrom and institutional theory

It is unquestionable that Elinor Ostrom's work continues to represent a substantial point of reference for the water commons research agenda. Her footprint operates across the three levels of conceptual/definitional, theoretical, and methodological. At the conceptual level, there remains an influential focus on water commons as common-pool resources managed by communities, and on

commons governance as common property regimes; this focus is robust even as it is increasingly challenged by relational and social constructivist perspectives. Although these critiques do not negate the value of Ostrom's contribution, they reflect evolving understandings of how everyday practices, identity, discourses and frames interact with collective action. The theoretical footprint, on the other hand, is most evident in the enduring appeal of the 'third way' that is situated *between* the market and state governance. This theoretical footprint is also visible in Ostrom's capacity to analytically debunk the wrong Hardinian interpretation of the 'tragedy of the commons'. Yet, while Ostrom's original articulation of institutional diversity remains a cornerstone, the critical scholarship arena has grown more sceptical of institution-centric analyses. Debates surrounding institutionalisation – including whether the codification of rules may depoliticise or reduce commons views and practices – explains a shared inclination to question some of the foundational assumptions of Ostromian thinking. Some scholars argue that Ostrom was in many respects a pioneer in the space of political ecology and that her work already had the seeds of analytical concerns around power and discursive practices in relation to collective action. Ongoing adaptations of the Institutional Analysis and Development (IAD) framework that integrate these aspects illustrate its semantic and theoretical openness (Clement, 2010; McCord et al., 2017; Brisbois et al., 2019; Epstein et al., 2020). These works also show how important it is that institutional frameworks such as the IAD are seen more as an analytically flexible tool rather than as a theory. In summary, building upon Ostrom's legacy remains both possible and productive for a variety of scholars from different epistemologies and epistemic communities.

There is, however, a potential downside, in that the 'halo effect' that surrounds Ostrom's work can produce uncritical reverence and inhibit novel theoretical departures. The risk of a possible 'blueprint effect' has been visible on many occasions; Ostrom's design principles, for example, have often been used as normative blueprints for designing, evaluating and researching community irrigation schemes (Dell'Angelo et al., 2016). Ultimately, the risk is that practitioners or scholars uncritically apply any common property solutions, thereby neglecting the sociopolitical, cultural and ecological specificity of each (water) context.

Ostrom herself was a pioneer and strong proponent of methodological diversity and integration (Poteete et al., 2010). Although not assessed in detail, the literature reviewed here displays a somewhat narrow range of methodological approaches. Qualitative methods are prominent, including ethnographies, case studies and critical analyses; however, large-N comparative studies and experiments remain less common than in earlier periods of commons scholarship. Moving forward, this raises the key question as to whether methodological diversity should be expanded, especially given the complex, cross-scalar dynamics that characterise contemporary water governance.

Should water commons research embrace conceptual clarity?

Our review shows that the resource- and common-property-centric definition of commons that has been prevalent for several decades is seen as insufficient for capturing the complexity of contemporary water governance issues. It is possible to argue that, to a certain extent, the primacy of the resource and rights approach has given way to a plurality of perspectives. Commons are increasingly conceptualised as dynamic sociopolitical processes, relational practices, or even imaginaries (that is, collective understandings and visions) that mobilise different political priorities, forms of environmental management and social cooperation. Amid such a plurality of perspectives, how to embrace conceptual clarity? And, arguably more importantly, is such clarity unequivocally desirable?

One of the central contributions of the Ostromian approach was bringing conceptual clarity to research on the commons. The distinction between common-pool resources, open access, and common property regimes was crucial to debunking Hardin's predictions and laying the foundations of institutional theory. Pursuing conceptual clarity has an added value for theory building in that it avoids repetition and the 'reinvention of the wheel'; it also facilitates dialogues between scholars and practitioners. Clear

definitions allow for more systematic comparisons, stronger cumulative knowledge, and more robust analytical frameworks. A shared conceptual vocabulary improves the communicability of research findings and facilitates the translation of insights into actionable governance and political strategies.

There are also, however, potential downsides associated with stressing conceptual clarity. Rigid definitions may homogenise diverse practices and obscure the plurality of ways in which communities relate to water. Weberian categories can be used to restrict the complexity of the often-hybrid forms through which water realities are defined, shaped and governed. Ultimately, it is important for commons research to remain attentive to how commoners themselves understand and frame their realities; however, this should happen through transdisciplinary integration without fear of political involvement. Emic (insider) perspectives are not simply reflections of local circumstances, but rather form integral components of how commons are defined and therefore constituted. Overemphasis on definitional precision may also produce a conflation of clarity with standardisation – an outcome that would certainly be antithetical to the political and epistemic commitments of (water) commons studies.

As hinted throughout the paper, the clarity of the water commons concept might have become blurry with the ever-evolving plurality of perspectives, studied contexts and issues at hand. Ensuring inclusion of the diverse ways in which communities relate to water may therefore require moving beyond rigid definitions and embracing understandings that extend past conventional framings. Such an approach raises potential commensurability challenges, given the wide range of existing definitions. The 'overlapping definitions' identified in this review, however, suggest that it remains possible to navigate this complex scholarly landscape. To be sure, the review relied on studies that explicitly used the term 'water commons' as its point of departure; as a result, we may have overlooked potentially relevant contributions that discussed related themes but did not use this exact terminology.

It is likely that water commons scholarship can advance and evolve within the productive tension between the pursuit of analytical coherence and the recognition of lived diversity and practices, and that it can build on earlier work and different theoretical legacies while engaging directly with the empirical complexity of collective action around freshwater resources.

Can the commons 'save the world'? Or should we 'save the commons'?

Water commons scholarship has long revolved around a central concern: the capacity of collective governance to ensure sustainable management of water resources. While earlier Ostromian scholarship focused primarily on localised governance arrangements, contemporary commons perspectives broaden this view by situating governance within multiscale socio-environmental dynamics. Some of the studies in the review show how local commons governance, although significant, cannot be assumed to provide a panacea. The field of water governance has experienced such 'panacea traps', yielding silver-bullet prescriptions at the expense of nuanced and localised findings. This point was already well addressed in general (Ostrom et al., 2007) and specifically in relation to water institutions (Meinzen-Dick, 2007). The tendency to prescribe the state, user groups, or markets as a solution stands in stark contrast to empirical evidence that shows that different solutions work differently depending on the specificities and constraints of location, time, and the scale at which they are being carried out.

The above became particularly evident with regard to the role of markets and the state across rural and urban contexts. The relatively optimistic accounts of state interventionism in rural sanitation and irrigation management in China or Japan contrasted sharply with the more pessimistic experiences of privatisation and municipalisation of lake governance and drinking water in India and Italy. It is an open question for further research whether these differences reflect the higher exposure of urban water commons (than rural) to the wrongs of marketisation and governmental control, or whether they mirror a theoretical bias in the literature (as the institutional theory has traditionally informed rural commons).

More recent critiques serve a constructive purpose: they bring the circle of water governance scholarship back to its empirical roots in situated, place-based practices and institutions. Rather than

endorsing the notion that the commons represent a universal remedy for global crises, emerging scholarship emphasises its potential as an analytic frame that is capable of revealing the relational, political and ecological conditions under which collective management may be effective.

In this sense, the contribution of the commons lies less in its capacity to 'save the world' and more in its ability to debunk dominant market and state-centric paradigms by supporting alternative modes of socio-ecological coordination in general, and more specifically of freshwater resources. The emergence of globally dominant hegemonic agendas such as the recent resurgence of water privatisation, marketisation, deregulation and financialisation of water as a commodity (as proposed by the Global Commission on the Economics of Water; see GCEW, 2023), raises an ideological challenge, not only about appropriate water governance measures but also about the moral, political and ontological value of water. With the GCEW's promise to develop "new thinking on economics and governance" (GCEW, 2023, para. 5), the trajectory of water governance's evolution once again risks crossing paths with one-dimensional (economic) conceptualisations and prescriptions (Puy and Lankford, 2024; Vinciguerra, 2024).

This concern is especially pressing at a time when the negative impacts of water commons privatisation and water 'grabbing' are being increasingly documented (Bakker, 2003; D'Odorico et al., 2024). Commons scholarship has frequently examined water resource governance to discover how collectively managed systems sustain themselves through evolving internal norms, institutions and shared community objectives. Despite this capacity for resilience, however, such systems remain exposed to external pressures, particularly those associated with globalisation; these can render them vulnerable to corporate appropriation under conditions of unequal power.

CONCLUSION

The concept of the 'commons' is central to environmental governance and rural development. It is clear that theoretical and analytical representations of this concept carry important real-world implications. The Hardinian prescriptions of state control or privatisation as the only solutions to the 'tragedy of the commons' have had, and continue to have, long-lasting influence on agenda-setting and on policy- and decision-making, even though Ostrom and colleagues demonstrated the gross misrepresentation at the heart of Hardin's depiction. Their work, alongside perspectives emerging from critical water studies, demonstrates how necessary it is to provide analytically and empirically grounded definitions of the commons, that is, definitions that have clear real-world and policy consequences.

Tracing out the ripples cast by commons scholarship, this review identifies the synergies, divergences and emerging debates within the evolving landscape of water commons research. This is of particular urgency in the water world, given the growing tendency to refer to water as a 'common good' or a 'commons'; these are terms that often lack rigorous definition and may conceal other interests, as reflected in recent discussions of the 2023 United Nations Water Conference (Vinciguerra, 2024).

Despite the frequent references to Ostrom and to the institutional theory of the commons, the circle of scholarship has widened from that originally defined by institutional theory. While Ostrom's work remains a significant point of reference for the water commons research agenda, critical literature has grown more sceptical of institution-centric analyses. This review thus uncovers the epistemological foundations of the scholarship and delineates four perspectives within the analysed literature on water commons that demonstrate the continuously expanding boundaries of this concept: institutional, critical, relational and social constructivist. This theoretical plurality across water commons studies demonstrates that none of the strands, if applied in a siloed manner, will exhaustively cover the diversity of contributions that have emerged over the years. To contribute to a more nuanced analysis, we move beyond this theory-grounded lens and adopt an empirical strategy in order to unpack, in a case-by-case manner, the perceptions of water commons alongside its specific associated problems and solutions. Based on the analysed literature, this research arrives at four dimensions of water commons: resource

(water as shared materiality); organisation (collective governance arrangements); community (shared identity and mutual dependence); and process (commoning as collective action). Most of these appear alongside at least one of the other dimensions, mirroring the linkages among, and complexity of, the explored socio-ecological settings.

This diversity of framings begs the question of the need for conceptual clarity. While Ostrom's original contribution sharpened the edges between concepts of common-pool resources, open access and common property regimes, new waves of water commons research often move beyond such conventional understandings. The 'overlapping definitions' identified in this review suggest that it remains possible that these plural definitions will accommodate themselves to a certain commensurability. Further research ought to reflect the richness of water commons scholarship by engaging with this diversity of contexts. This should also include contributions that do not explicitly use the language of 'water commons', some of which may have been omitted in this review.

The review also reveals three groups of commons-related governance challenges. They cluster around three broad modes: market governance, state governance and commons governance itself. The problems within the first mode relate mainly to privatisation, commodification and marginalisation; here, social mobilisation and participatory alternatives that emphasise collective or community-based initiatives are proposed as solutions. Within the state governance mode, key challenges centre around top-down imposition and institutional displacement. Proposed responses closely mirror those put forward in critiques of market governance: recognition of place-based knowledges and hydraulic imaginaries, as well as more inclusive and participatory decision-making processes. The last subset, the commons governance mode, refers to challenges within commons governance itself. This refers particularly to scale, coordination and internal tensions. Here, the plurality of prescribed solutions varies across state intervention or state-supported common property regimes, reinforcement of shared mental models, trust- and justice-oriented norms within communities, and commons movements as capable of balancing mobilisation and institutional reproduction across levels.

This brings us back to the question of whether the commons can 'save the world'. Mindful of the 'panacea trap', we argue that the contribution of the commons lies less in its capacity to 'save the world' and more in its ability to debunk dominant paradigms by supporting alternative modes of socio-ecological coordination. This is particularly important given the tendency of policy communities to regularly converge around narrow hegemonic agendas, as illustrated by the recent revival of water privatisation, deregulation and financialisation advanced by the Global Commission on the Economics of Water.

Based on the analysed literature, this review also detects two major scientific debates: (1) on state vs. community management, and (2) on the complementarity between rights-based approaches and relational commons governance. Some of the reviewed publications remind us that the old 'state management vs. community-based management' debate is far from settled, particularly in the context of highly centralised and/or authoritarian countries. Studies on governance practices in China and Japan suggest that water commons can thrive under strong interventionist governments. Other authors refer to the human right to water as a tool for collective empowerment, while yet others see the HRW as being vulnerable to technocratic or market co-optation unless institutionally embedded in true participatory frameworks.

Finally, we identified two threads that may be worth pursuing in future research. The first of these is the renewed attention to the question of the endurance of water commons; this is particularly worthy of attention in light of increasing external pressures such as privatisation and state encroachment. The second thread is the ambivalent role of social movements, which can either defend and revitalise commons regimes or reproduce exclusions and internal tensions.

Overall, this review demonstrates a shift in the scholarship away from exclusively resource- and rights-centric definitions of the commons; this marks a step towards embracing the complexity of contemporary water governance. The new currents of water commons scholarship emerge as more attuned to power

dynamics, relational values and discourses. Such trends suggest a reflexive evolution where blind spots are uncovered and neglected voices are made to be heard. That said, we do not see a full replacement of the Ostromian view, but rather the emergence of different attempts at recognising its legacy and expanding it, which demonstrates the ever-growing applicability and evolution of the associated theory. Through this continuous evolution, commons scholarship proves its suitability for addressing and responding to the challenges of the contemporary water governance landscape.

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