



Contested Socio-Material Transformations in Irrigation Communities: Exploring New Entry Points for the Analysis of Commons and Collectives

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INTRODUCTION: POLITICS OF IRRIGATION COMMONS

Institutions for collective action have long been hailed as a panacea for common pool resource use dilemmas. The collective management of irrigation systems by irrigation communities was one of the important sources of inspiration for Elinor Ostrom's seminal work "Governing the commons: The evolution of institutions for collective action" (1990). This is not surprising given that community-managed irrigation systems have a centuries-long tradition in almost all continents of the world, playing a key role in providing water for crop/food production, domestic water supply, and other uses. Their functioning and maintenance have been guaranteed through different forms of institutionalized collective action, mobilizing individual, family, and community labor as well as other resources for the development and maintenance of irrigation systems, structuring negotiations over irrigation water access and building rural community ties over centuries. Though many user-managed irrigation systems are rooted in cultural traditions and stabilized through intricate institutional arrangements, they are neither fixed nor static. Rather, irrigation systems and the communities that built and govern them can best be conceptualized as dynamic socio-technical configurations interacting with complex socio-ecological systems. In such ever-changing systems, irrigation communities around the world constantly face new challenges to which they must adapt to ensure their sustainability (Hoogesteger et al., 2023a).

This special issue aims to develop a better understanding of these changes and the various (f) actors interacting to recreate, sustain, and transform user-managed irrigation systems. It does so by adopting an explicitly political lens, paying special attention to contestations of how, for whom, and by whom these systems function and are recreated. It analyzes changing irrigation systems in their different dimensions, including changes in their internal social fabric; in their relations to state and other institutional frameworks and actors; in their dependence on material infrastructures; as well as in their embeddedness in evolving agricultural production systems and broader rural relations. To achieve this, it collects case studies from various continents addressing different aspects of transformations in community-managed irrigation and domestic water supply systems.

This special issue has the **specific aim of exploring new theoretical perspectives** to better understand these politics of transformation, their triggers, and their consequences. We firmly embed ourselves in the commons literature, but, in line with some of the findings in the recent literature

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review by the editors of the *International Journal of the Commons* (van Laerhoven, Schoon & Villamayor-Thomas, 2020), we venture into underexplored paths in this tradition. While lying at the roots of the commons literature (see Ostrom, 2011), of the ‘big five’ commons topics, irrigation so far received the least attention (van Laerhoven, Schoon & Villamayor-Tomas, 2020). We believe that this is undeserved, as the changes in and pressures on user-managed irrigation schemes present us with interesting opportunities to expand the theorizing of irrigation management to other communal resource systems. First of all, irrigation systems exhibit certain particularities, which may be less explicit, but not irrelevant in other resources: their strong, materially structured asymmetries which pose a particular governance challenge (Ostrom & Gardner, 1993). Such asymmetries often trigger explicit politics of change and transformation in irrigation systems (Janssen et al., 2011), which tend to be more veiled in the management of more symmetric commons. This points to a relation between commons politics, institutions, and material infrastructures which remains to be fully explored in the commons literature (Cleaver, 2012). Analyzing these interactions between the social and material dimensions of irrigation systems pushes us to examine the role of tensions and conflicts over inequalities and power in the structuring of the institutions governing the commons. Hence, one of the points of departure for this special issue is the recognition that irrigation and water management and governance are intrinsically political and therefore contested. With this, we acknowledge the persistence of power relations and inequalities in the institutional arrangements, relations, and practices that shape and recreate irrigation governance. Processes of transformation — be these technical, institutional or material — always (threaten to) rearrange existing power geometries and positions, leading to frictions that express as resistances, collaborations, and confrontations between different actors across space and time. Recognizing and understanding these frictions and their underlying mechanisms are therefore fundamental to advance towards a better understanding of the on-the-ground realities in which irrigation communities are evolving and surviving around the world. Present-day socio-economic, cultural, political, and ecological transitions exacerbate these frictions and present us with new practical and theoretical dilemmas. In particular, it invites us to theorize and explore the different dimensions of socio-material change at different scales and in different domains.

In line with the emergent literature on co-management and hybrid governance (Chai & Zeng, 2018; van Laerhoven, Schoon & Villamayor-Tomas, 2020; Garcia-Molla et al., 2020), we recognize that user-managed irrigation systems, possibly because of their inherent material asymmetries, often intersect with state institutions (Hunt, 1988; Hoogesteger,

2015; Boelens, 2015; López et al., 2019), posing particular challenges to theory-making. It urges us to reflect on the concept of “the state” in its different guises, and on the institutions, infrastructures, policies, and practices through which the state finds expression in relation to irrigation governance and management at different interlocking scales (Harris, 2012; Meehan, 2014; Loftus, 2020).

In the remainder of this introduction, we first elaborate on how recognizing the political nature of irrigation management can theoretically enrich commons research. While all contributions to this special issue mobilize their own theoretical frameworks, in this editorial, we propose a particular perspective which ties these variegated contributions together and offers us insights into their shared interests and concerns. For this, we borrow from Bob Jessop’s strategic-relational approach to state theory, which has been a major source of inspiration to the field of political ecology (Loftus, 2020). Thereafter, we introduce the different contributions to this special issue, situating them within this theoretical framework. Finally, we close this contribution by taking stock of the advancements that have been made through this special issue, and by pointing out the pathways for further exploration and theorization laid bare by this special issue.

TOWARDS A STRATEGIC-RELATIONAL APPROACH TO THE POLITICS OF IRRIGATION COMMUNITIES

Much analysis of user-managed irrigation systems has been informed by the notions developed by Elinor Ostrom in reaction to the work of Garrett Hardin. Her initial notions of collective self-governance of the commons as an alternative to private property regimes or state governance were advanced further by others through the Institutional Analysis and Development framework (IAD) and the Social-Ecological System framework (SES) (van Laerhoven, Schoon & Villamayor-Tomas, 2020). Driven by the urge to prove that self-governance works, this literature has paid relatively little attention to the conflicts and struggles through which self-governance is recreated.

Struggles and conflicts arise from the intricate entanglements of irrigation governance with culture, identity, and power and its relations to state and market actors at multiple scales (Boelens, 2014; Hoogesteger et al., 2017, Dolenc & Žitko, 2016). Hoogesteger et al. (2023a) have pointed at the importance of the multi-scalar political relations and strategies through which irrigation communities engage with external actors to defend their water allocations, infrastructure, and organizations vis-à-vis upcoming threats and/or to fulfill internal needs such

as investments or technical expertise. They also open the analysis “not only to formal and informal normative frameworks, and irrigation organizations but also to individual action, patronage and clientelist systems, family ties and the importance of local (hydraulic) identity within irrigation communities” (p. 8). Such a politicized approach invites a renewed sensitivity to power, strategies, tactics and conflicts in the conceptualization of common pool resource management (see [Clement, 2010](#) and [Whaley, 2018](#)). Therefore, in this special issue, we explicitly aim to focus on understanding and theorizing transformations and continuities through the lens of power struggles, conflicts, and mobilizations both within user-managed irrigation schemes as well as between irrigation systems and external actors and organizations.

We define irrigation systems as assemblages of water flows, techno-material infrastructures, and social institutions, ‘all at once’ ([Boelens, 2014](#); [Reyes Escate et al., 2022](#)), bound together and dynamized by actors and their strategizing practices (see also [Hoogesteger et al., 2023a](#)). To understand the politics of these systems, it is necessary to unravel how the dynamic interconnections between institutions, actors, identities, and material infrastructures shape and are shaped by individual and collective agency ([Mirhanoğlu, 2023](#); [Devkota et al., 2023](#)).

Critical institutionalist approaches have long discussed the mutual influencing of institutional structures, power, and political agency ([Agrawal & Ribot, 1999](#); [Cleaver & de Koning, 2015](#); [Mollinga, 2019](#)). But while power has been central to the commons literature, it has often remained under-theorized ([Quintana & Campbell, 2019](#)) or discussed in a one-sided manner. The concept of commons governance leans heavily on the idea of collective agency, which in political science has been described as ‘power with,’ denoting the invigorated agency or empowerment derived from collaboration in symmetrical relations. The concept of ‘power over’ (coercion, domination), indicating asymmetrical relations, has long been cast aside as antithetical to commoning. For commons theorists, this reflects the normative ambition to demonstrate that people can cooperate and share without the interventions of an external enforcer ([Boonen et al., 2019](#)). Power over is generally portrayed as a zero-sum form of power (if A has power over B, B loses power to A), as opposed to *power with* being presented as a positive sum form of power. In commons theory, power over (as exerted by, for instance, central state institutions) is often seen as endangering the *power with* that empowers communities.

However, political theorists have demonstrated that the distinction between power over and power with does not need to be based on normative judgment. Indeed, as [Allen \(1998\)](#) explained, power over does not always have negative effects on the subjects of power (think of

the power of parents or teachers over children). Instead, the joint analysis of different forms of power can be analytically motivated ([Haugaard, 2012](#); [Pansardi & Bindi, 2021](#)) to better understand the dynamics of commons governance ([Bennett, 2019](#)). In this special issue, we call for an analytical, theoretically informed approach to power, to study institutions of commons governance as encompassing both zero-sum and positive-sum aspects of power ([Haugaard, 2012](#)). Such an approach will lead us to a more political understanding of the institutions for irrigation governance. While such institutions certainly facilitate *power with*, allowing irrigation actors to collaborate and manage the scarce resources they collectively depend upon, such institutions will always also support some form of *power over*, empowering certain actors in relation to others ([Kashwan et al., 2019](#); [Mirhanoğlu et al., 2022](#)).

To understand the intricate dynamics of power, we propose a strategic-relational approach to irrigation institutions. A strategic-relational approach to institutions has been developed in the so-called Lancaster school, in particular by [Bob Jessop \(2007, 2015\)](#), in his lifelong study of (state) power and (state) institutions. Whereas this theory is expandable to non-state institutions, it has so far found little application in studies of water governance institutions (but see [Bakker, 2003](#); [Ioris, 2012](#); [Mollinga, 2019](#)).

A key point of Jessop’s strategic-relational approach is that institutions and infrastructures, by structuring and stabilizing power relations, offer different social actors unequal opportunities to achieve their goals. Given a certain institutional opportunity context, some strategies will work better than others. Institutions and infrastructures produce such structural selectivity, i.e., empower some (collective) actors while disempowering others, through rules and regulations of what is or is not allowed or possible; but also by affecting actors’ capacities of imagining, inventing, and sharing what is feasible or just ([Jessop & Oosterlynck, 2008](#); [Mollinga, 2019](#)). Such imaginaries can stabilize institutional configurations, but can also be mobilized to resist institutional domination and control (e.g., [Feng et al., 2023](#)).

Importantly, a strategic-relational approach not only emphasizes the structural selectivity of institutions vis-à-vis actors and their political strategies; it also assumes that institutions are social constructions, i.e., the product of actors’ political strategies. In that sense, actors do not merely operate within institutions; they also manoeuvre strategically to shape and reshape institutions in a direction that increases their *power with*, as well as *power over*. This politics of institutions, as [Thelen \(1999\)](#) argues, is not just determined by an institution’s social function (e.g. water governance), but as much by power differences between actors with a direct or indirect interest in the functioning of these institutions (e.g., water users) ([Quintana & Campbell,](#)

2019). While much of the commons literature focuses on functional, or external drivers for institutional change or continuity (e.g., environmental change, top-down imposed policy directives), we contend that paying attention to internal pressures for institutional change, i.e., the balance of *power with* and *power over* embedded in the institution is as important in irrigation studies; an internal dynamics which will also affect institutions' capacity to react and adapt to external pressures.

This explains why institutional change often takes the shape of bricolage, a nonteleological, non-linear process of recombining and transforming institutional elements that derive their persistence or change as much from their functionality as from the power relations between the communities of practice that have formed around them (Sehring, 2009). Such communities of practice gather actors who share an interest in and understanding of institutional elements. These interests and worldviews shape their willingness to maintain or change institutions, and the directions of change they are willing and able to support (Cleaver et al., 2021).

In sum, the strategic-relational approach suggests three important avenues of research. First, it puts forward an interest in the role of *actors and their shared imaginaries* about water, water justice, and water governance. It draws attention to inequalities in power, and different narratives on interests (e.g., water access) of different actors in understanding how actors influence the formation of water institutions.

Secondly, it draws attention to inequalities as a result of institutions of water governance. Emphasizing the strategic selectivity of social institutions and material infrastructures, this perspective shows how institutions and infrastructures do not only structure water access, but also power relations between, and the space of maneuver of actors.

Thirdly, it calls for research on institutional transformation as the outcome of interactions between strategizing actors on the one hand, and the strategic selectivity of institutions on the other. It analyzes how institutional inequalities and power imbalances structure the struggle between actors over institutional transformations.

THE DIFFERENT CONTRIBUTIONS TO THIS SPECIAL ISSUE

The special issue brings together seven contributions that tackle the avenues of research that a strategic-relational approach to irrigation politics has laid bare. At the risk of simplifying their conclusions, we have situated each article under one of the three lines of research, well aware that each article often combines different angles of research.

In the conclusion to this article, we will make up for our reductionism by emphasizing their entanglements. Here, we would like to emphasize the diversity of perspectives allowed by the strategic-relational approach.

IMAGINARIES, ACTORS AND ALTERNATIVE FRAMINGS

Under the first avenue, Hoogesteger et al. (2023b) introduce the notion of imaginaries as a conceptual entry to study and better understand how and why commons re-create and transform. They propose to explore imaginaries as assemblages and analytically divide these into dominant and alternative imaginaries to understand power differences and conflicts in irrigation institutions. Dominant imaginaries refer to how people imagine their social existence around entrenched norms and expectations. Alternative imaginaries point at framings that critique established social relations and its related 'dominant' imaginaries. Such alternative imaginaries, the authors argue, create 'germs' that can lead to institutional transformation and the constitution of new realities and commons. With this lens, the authors analyze contestations that were triggered by the switch from traditional surface irrigation towards pressurized drip irrigation in two irrigation communities in the Valencia Region of Spain. While drip irrigation is widely promoted by the state, related policies and many irrigation experts, the irrigation communities of Carcaixent and Potries show how, among the commons, a different way of assembling irrigation and the social, cultural, material, and economic relations around it is challenging the introduction of this new technology. Through this study, the authors show the importance that imaginaries have in the re-creation, transformation or protection of specific irrigation technologies, practices, and related institutions and values. In doing so, they show their contested and thus intrinsically political nature in that different imaginaries advance different orders with related power relations and hierarchies.

Contributing with another case study from Spain, Sanchis-Ibor et al. (2023) further develop this perspective of imaginaries through the concept of framing. Engaging in debates about the co-management of groundwater in the Requena-Utiel aquifer, the authors analyze how the co-management of groundwater is facilitated by establishing a shared understanding among users. Their participatory 'framing' approach moves from cognitive to interactive framing to achieve a shared understanding of aquifer co-management. It highlights the key role that information and transparency play in developing a shared understanding of problems as a basis to improve co-management. At the same time, their study highlights

the difficulties of establishing agreements that question the current practices and institutionalized power relations between different water users, the state, and other actors.

Focusing on framings and their relations to (in)equities, Liebrand et al. (2023), engage in research-policy debates about the phenomenon of farmer-led irrigation development in Africa. They criticize the adoption of the 'farmer lens' in research on the use and management of common pool resources (land and water) in irrigation. The authors argue that while such a focus on farmer-led irrigation emancipates the farmer's perspective, it also obscures inequities around gender and social diversity in African smallholder farming. The authors build their argument by reflecting on survey data and field observations from two research projects in Mozambique. In doing so, they scrutinize the assumptions that the project team had made in the design of these projects, concluding that an imaginary of farmers' agency ignores inequities along gender and other lines. The authors emphasize the role of researchers in shaping imaginaries of irrigation, and suggest that a stronger focus on (irrigated) plot use, flows of mobility, and virilocality can inform more grounded, equity-sensitive irrigation policies.

INSTITUTIONS, INFRASTRUCTURES AND POWER RELATIONS

Contributing to the second strand of inquiry identified under a structural relational approach, which focuses on the role of institutions and infrastructures in structuring water access and power relations between actors, Mirhanoğlu et al. (2023) analyze how the introduction of drip irrigation in a community-managed irrigation system in Turkey led to the rearrangement of the social and institutional irrigation entanglements. They do so by recognizing the intrinsic socio-material interdependencies of infrastructures. From this perspective, the authors analyze the social and institutional changes that were triggered by the introduction of drip irrigation infrastructure in Ağlasun, a rural town located in the southwest of Turkey. Through an ethnographic study, they show how the introduction of drip irrigation in a traditional irrigation system rearranged the interactions and relations between institutional arrangements, material infrastructures, and strategizing actors. This resulted in a reshuffling of the operation and maintenance of irrigation infrastructures, water distribution rules and water pricing. They analyze these changes by adapting the concept of institutional bricolage, including the material as a central focus, within the analytical notion of socio-material bricolage. This new notion, the authors contend, offers a nuanced understanding of how material

infrastructures, and institutions are intrinsically connected through individual and collective agency.

Hofstetter et al. (2023) analyze how the introduction of neoliberal policies, the rearrangement of infrastructures, and the introduction of expert knowledge in community-based water management have undermined the capacity of local communities to manage their water resources collectively. They do so based on a case study of water service provision outside of the built-up zone in the Canton of Lucerne, Switzerland. In this area, citizens are responsible for establishing and maintaining their own water services. They describe such water systems and their management as commons because citizens organize legal, institutional, and infrastructural aspects of access, and distribute water to the citizens in a collective manner. Through the conceptual lens of conviviality, the authors analyze how water commons are being supported and regulated by public institutions. They show how the neoliberally inspired New Public Management (NPM) put pressure on this public support. By analyzing one intervention project in this area, they demonstrate how a market-modernist approach that is based on expert engineering knowledge failed to recognize these commons as alternative forms of social organization and negatively affected their viability through technological and managerial interventions. This is done through the introduction of new technologies, new forms of knowledge and the undermining of existing local institutional arrangements that depend on conviviality and self-management. At the same time, they also show that local actors do not passively adopt such external projects but use their institutional space of maneuver to resist and adapt them to their own needs and context.

INSTITUTIONAL TRANSFORMATIONS, POLICIES AND STRATEGIZING ACTORS

Under the third strand of inquiry, which aims to better understand how, in a context of broader changing policies and socio-political transformation, local users find space to resist, maneuver, and carve out their own space, Xu et al. (2024) investigate China's irrigation policies. They do so through a governmentality framework. Their paper explains how Chinese irrigation policies follow global discourses whilst imbuing these with new ambitions of amongst others an ecological civilization. Following a local village case study, the authors show how, amidst the decline of commons' local governance and water user responses, the state's irrigation policy and projects (that are implemented through different techniques of government) are adapted and negotiated. They show how local governmental actors and ordinary villagers challenge national irrigation policies

and try to nudge institutional changes to their benefit. Through the creation of local noncongruent institutions, practices, and technologies that contradict state-assumed collective collaboration and government-aligned behavior, local actors carve out their own space for maneuver.

Finally, Hoogesteger and Rivara (2023) focus on understanding how broader agrarian change and the neoliberalization of the agricultural sector impact institutions for collective action and related resource access. They do so through a case study of a groundwater irrigation community in the northeast of the state of Guanajuato, Central Mexico. They show how, in a context of neoliberally induced agrarian change, a few producers with capital acquired through international migration and remittances have accumulated access to land and water in the irrigation community. They show that this accumulation has gone hand in hand with the transformation of production to the high-value agro-export crop asparagus. They show how the transformation to this crop has kept the irrigation community viable. At the same time, they also show that this process led to the accumulation of access to land and water by a few irrigators who carved out space to maneuver in the new context. However, this has come at the cost of significant transformations as now the irrigation community is composed of a very different and much reduced group of users/producers. Through this study, the authors point at the importance of understanding how broader processes of policy induced agrarian change can lead to transformations in access to productive resources, and the consequences this has for institutions for collective action.

CONCLUSION: NEW PERSPECTIVES FOR THE STUDY OF THE COMMONS

In this special issue, we discuss the politics of irrigation. With a focus on contestations and conflicts, we have laid bare how the relations between actors and stakeholders on the one hand, and institutions and infrastructures on the other, are dynamic and rife with tensions. They bring us back to the notion that water and thus irrigation are intrinsically political and therefore contested at different scales and in different arenas. Most of these contestations, or at least those that get the most attention, are those contestations that take place within and among different institutional arrangements. Such institutional arrangements and the contestations that take place within them can be very local within small collectives, as analyzed in Hoogesteger and Rivara (2023), Mirhanoğlu et al. (2023), Sanchis-Ibor et al. (2023) and Hoogesteger et al. (2023b) or play at broader interrelated scales simultaneously, as

analyzed in Xu et al. (2024), Liebrand et al. (2023) and Hofstetter et al. (2023). These different contestations bring to the fore that differing interests, imaginaries, and power positions lead to continuous and transformative processes of change to institutions for collective action. The transformation of infrastructures, institutions, normative frameworks, and related practices and relations is deeply intertwined (Hommes et al., 2022) and often expresses through processes of change in which all these different dimensions transform interactively, not only institutionally but also materially and territorially (Boelens et al., 2016; Hoogesteger et al., 2016).

Jessop's strategic-relational approach allows us to reveal the unity in the diversity of contributions to this special issue and points to three different perspectives for the analysis of the politics of institutional change: one that emphasizes the role of actors, imaginaries, and framings in the politics of institutional change; one that focuses on institutions and infrastructures as structuring actors' power relations and space of maneuver; and finally, one that emphasizes the mutual and dynamic interaction between strategizing actors and strategically selective institutions and infrastructures.

But with this special issue, we do not want to shift all our attention to one particular theoretical framework, no matter how well-crafted it may be. The different contributions have shown how specific issues require the crafting and use of specific theoretical concepts and perspectives that provide more depth to each of these three perspectives. Concepts like framing, imaginaries, lenses, or discourses elaborate the importance of collective understanding and interpretation in the shaping of collective action, whereas ideas like socio-material bricolage, governmentality, or conviviality examine the dynamic and intricate interactions between actors and institutions. This special issue is a call for further integration and combination of larger, system-level frameworks with particular concepts and theories which allow us to operationalize such higher-order theories in relation to specific cases.

Through the various papers, we have identified three areas of institutional change where our strategic-relational lens can be applied fruitfully and where we hope commons research can be politicized further. First, a series of cases have focused on the reshuffling of interests and imaginaries as a consequence of changing material contexts and infrastructures (the transition from surface to drip irrigation in Hoogesteger et al., 2023b and Mirhanoğlu et al., 2023; the modernization of irrigation in Xu et al., 2024; or changes in agrarian production and ensuing water consumption in Hoogesteger and Rivara, 2023). A strategic-relational lens suggests us to investigate how, in the case of such changing circumstances, irrigation actors strategize to improve their

position by trying to nudge institutional and infrastructural changes in a direction that might increase their space of maneuver or access to resources.

Secondly, changing relations between state institutions and collective irrigation institutions are rebalancing power relations, triggering a politics of institutional change (as in Xu et al., 2024 or Hofstetter et al., 2023). Here as well, a strategic-relational approach will bring us to investigate how changing institutional relations affect the strategic positions of individual actors. In our cases, it has triggered a variegated politics of defense, where non-state actors resist state-led change to protect their own position of power.

Finally, two papers have also emphasized the role of researchers in institutional politics. They reveal how research entails its own strategic selectivity (Liebrand et al., 2023) and could strategically be deployed in the re-imagining of collective action (as in Sanchis-Ibor et al. (2023)'s study on groundwater management). This may serve as a warning to researchers to reflect on the way their conceptualizations and imaginaries affect the power relations of our research subjects, vis-à-vis researchers, but also in relation to the institutions of collective action they are embedded in and in relation to the narratives they deploy in their own politics of institutional change. Clearly, while studying commons and commoning, we cannot stay out of the action. Instead, we have to assume that we have the potential to have a significant impact on processes of change and be conscious and conscientious about our own strategic contributions.

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