

FOCUS ARTICLE

Power in/of/as water: Revisiting the hydrologic cycle in the Peruvian Andes

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Water is important not only as a natural resource but also as an object of political empowerment, social meaning, and cultural imagination. To unpack the social nature of water, the article examines it as “a total human-material fact” which implies enquiring into water’s fundamental properties, that is, its *transgressive*, *transmutable*, *transparent* characteristics, and exploring how the different forms of powers they engender impinge on human life. One such power is the power *in* water (its physical force), another the power *of* water (its social and political bearings), and a third the power *as* water (its cultural and imaginary potential). The article argues that regions suffering from chronic water scarcity are particularly pertinent to the study of water’s agentic powers. The Peruvian Andes constitutes such a field site. Reviewing regional literature on Andean history and contemporary culture the article explores how water’s multiple forces impact Peru’s current water crisis and shape Andean people’s struggle for social recognition. Moreover, the article employs the notion of the hydrosocial cycle to examine the author’s own ethnographic data discussing two cases that in opposite ways illustrate people’s perceptions of water and the way the convergence of its agentic powers constitutes a “total fact” in the Andes. It concludes that even though the discussion is focused on the regional context that shapes Andean water struggles, the two cases document something universal about water: its unique quality to represent raw physical power, malleable social and political power, and soft imaginative power at one and the same time.

This article is categorized under:

Human Water > Water Governance

Human Water > Water as Imagined and Represented

Science of Water > Water Extremes

1 | INTRODUCTION

Water has been the object of scholarly attention since the Greeks proposed it as one of the four archaic elements that constitutes the world—the others being earth, air, and fire (Linton, 2010; Strang, 2015). More recently, climate change and its impact on the environment have reminded us of water’s importance for human life (Schmidt & Peppard, 2014). Today, freshwater makes up less than 3 % of all Earth’s water and even though its deposits are renewable the future prospects of clean drinking water for the world’s population look gloomy (Kundzewiz et al., 2008). Glaciers and icecaps that hold 68.7% of all freshwater (USGS (U.S. Geological Survey), 2017) and constitute the main water supply of nearly 2 billion people (or one quarter of the current world population) (Mankin, Viviroli, Singh, Hoekstra, & Duffenbaugh, 2015) are retreating while groundwater, another important water source, is shrinking in many places. As a result, the planet is experiencing an

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environmental crisis that puts water stress, water conflicts, and water justice on the top of the political agenda in both the Global North and Global South (Bakker, 2007; Farhana & Loftus, 2015; Rodriguez-Labajos & Martinez-Alier, 2015).

Mountain regions are particularly vulnerable to climate change and water scarcity (Wiegand, 2008). They cover 25% of the global surface and offer home and living space for 26% of the world's population (Barnett, Adam, & Lettenmaier, 2005; Beniston, 2003). They are also the world's major water towers supplying half of its population with freshwater for irrigation, industry, domestic use, and hydropower (Orlove, Wiegand, & Luckman, 2008). In arid and semiarid areas, mountains provide as much as 90–100% of the freshwater resources (Beniston, 2003; Diaz, Grosjean, & Graumlich, 2003; Gagné, Rasmussen, & Orlove, 2014). But mountains are also some of the regions that are most sensitive to climate change (Yao et al., 2012), particularly in the tropics where glacier melting is an urgent problem jeopardizing the future lives of the local population (Carey et al., 2017; Cebon, Dahinden, Davies, Imboden, & Jaeger, 1998). The Andes is the world's second highest mountain range and Peru alone contains more than 70% of its tropical glaciers. Together with groundwater these constitute the country's principal freshwater supplies and as they are recede, it faces a major water crisis (Bolin, 2009; Bradley, Vuille, Diaz, & Vergara, 2006; Carey, 2010; Coudrain, Francou, & Kundzewicz, 2005; Vuille et al., 2008). The vulnerability of the Peruvian Andes is especially worrying because melt water from its glaciers supplies not only Andean people but also the country's mining industry and major cities with freshwater (Bury et al., 2011; Orlove & Guillet, 1985; Rangelcroft et al., 2013). To meet the growing water demand, the Peruvian state has passed a new water law and invested heavily in water infrastructures, which creates economic growth on the coast but generates water stresses in the highlands (ANA (Autoridad Nacional del Agua), 2010; Bury et al., 2011; del Castillo, 2011; Drenkhan, Carey, Huggel, Seidel, & Oré, 2015; Lynch, 2012; Oré, del, Orsel, & Vos, 2009; Vergara et al., 2007).

2 | WATER AS “A TOTAL HUMAN-MATERIAL FACT”

The article's aim is to examine water's importance as not only a natural resource but also an object of political empowerment, social meaning, and cultural imagination. Inspired by scholars who explore the fluid environments, liquid relations, social waterworlds, and cultural waterscapes that water gives rise to the article discusses how its multiple forces impact human life in the Andes and Andean society at large and investigates in more specific terms how water conflicts shape Andean people's struggle for social and cultural recognition (Barnes & Alatout, 2012; Boelens & Zwartveen, 2005; Hastrup, 2013; Hastrup & Hastrup, 2016; Helmreich, 2011; Strang, 2009). It proposes to study water as “a total social fact” which implies to understand it as “integral, even essential, to many if not most domains or institutions of society” (Orlove & Caton, 2010, p. 402). Reworking Emile Durkheim's concept of “social fact” French anthropologist Marcel Mauss coined “total social fact” in 1925 to understand the significance of the gift for social cohesion and to highlight the embeddedness of exchange relations in societal organization (Mauss, 1969). The term's key contribution was to set in motion society and its institutions as a totality but as Mauss never developed all its implied consequences, his notion of a total social fact has subsequently been object to a range of interpretations by both anthropologists and other scholars (Valeri, 2013). More recently, Molle, Molinga and Meinzen-Dick have employed the term to explore how “water's critical life-sustaining role in ecological functioning, food production, economic activities, health and recreation and its importance as spiritual value, makes it a resource that traverses both nature and society” (Molle, Mollinga, & Meinzen-Dick, 2008, p. 1). In a more proactive manner, Wagner suggests to study water not only as “a total social fact” but also as “a total ecological fact” in which the social is separable from the ecological only by semantic convention. Such a notion, Wagner argues, enables the scholar to inquire into the repertoire of social connections that water establishes “among all life forms and between animate and inanimate worlds” (Wagner, 2013, p. 2). From this perspective, the social in Mauss' “total social fact” glosses over a reciprocal relationship not only in-between humans but also between humans and nonhumans that ties these together in an indefinite set of exchange acts. An essential element for organic life, water plays a unique role in this symbiosis. Moreover, due to its propensity to flow and capacity to permeate other substances and materials including the human body water incarnates Mauss' idea of the gift, that is an object which continuously is offered and received, generating relations of dependence and control between humans and nonhumans and ideas of power and subordination between nature and culture.

Drawing on current debates within anthropology on posthumanism, multinaturalism, and nonhuman agency (Hornborg, 2017; Kirksey & Helmreich, 2010; Latour, 2011; Tsing, 2014) and, in particular, Tim Ingold's call to study the relationship between things and humans as a meshwork of penetrable substances that continuously leak and therefore are mutually constitutive (Ingold, 2012), this article expands on Mauss' notion of the social and proposes to study water as “a total human-material fact.” To uncover this “fact” and make comprehensible the human–water nexus, it argues, we must inquire into what Linton and Budds call the hydrosocial cycle, that is “the socio-natural process by which water and society make and remake each other over space and time” (Linton & Budds, 2014, p. 175). Understanding the water–human meshwork as a hydrosocial cycle, Linton and Budds suggest, directs our attention not only to what water is but also how it is made known and the

ways it internalizes social relations, social power, and technology. In the words of the two authors, such an approach “implies a shift from thinking of relations between things—such as the impacts of humans on water quality – to the relations constituting things—such as the cultural, economic and political processes that constitute the particular character of desalinated water, treated drinking water or holy water” (Linton & Budds, 2014, p. 173). Building on the notion of the hydrosocial cycle, a growing literature on water is now emerging that introduces terms such as “the hydrocosmological cycle” to inquire into the multiple ways indigenous people and other vernacular actors perceive water’s animated force (Boelens, 2014) and “hydrosocial territories” to unpack the sociopolitical complexity of dam development projects and rural–urban water transfers (Hommel & Boelens, 2017; Hommel, Boelens, & Maat, 2016).

The article contributes to this scholarship by inspecting three forms of power that water impinges on human life: power *in* water (its physical force), power *of* water (its social and political bearings), and power *as* water (its cultural and imaginary potential). The article’s hypothesis is that an enquiry into water in regions where it is a scarce resource offers a unique window on what Linton’s calls water’s social nature, that is the ideas, meanings, and values we confer upon water, and on what Hastrup refers to as water’s agentive powers, which includes not only water’s molecular properties and physical powers but also its imaginative implications (Hastrup & Hastrup, 2016; Helmreich, 2011; Linton, 2010). Following Strang’s proposition that “the formal qualities and characteristics of the object—whatever it is—are crucial in that they provide a common basis for the construction of meaning” (Strang, 2005, p. 97) and that “the importance of the characteristics of material things are particularly evident in relation to water” (Strang, 2009, p. 30) it examines water’s agentive powers. It argues that water possesses three elementary properties that in different ways influence Andean society. First, water is *transgressive*: it has a propensity to flow and can only be fixed temporarily (Strang, 2009). Second, water is *transmutable*: it constantly changes form (from liquid to vapor and to ice) and acts as a universal solvent and transformer of other substances (Boelens & Zwarteveen, 2005; Strang, 2015). Third, water is *transparent*: it is not only odorless and tasteless but also colorless which makes it a material of singular significance for human imagination and symbolism (Oestigaard, 2017; Orlove & Caton, 2010).

Employing the concept of the hydrosocial cycle as a framing device, the article starts by discussing the specific ways water’s three properties influence material, political, and social life in Andean society. It then moves on to explore Peru’s current water crisis and the water conflicts the country experiences through the lens of water’s three properties and to examine two ethnographic cases that illuminate the circumstances in which these either restrain or bolster Andean people’s struggle for water rights and equity. The article concludes by reviewing the scholarly knowledge about water and power in the light of Andean water struggles and the convergence and coproduction of water’s properties they entail.

3 | THE POWER OF ANDEAN WATER

Containing and controlling water is a difficult task anywhere but in the Andes it is particularly demanding because of the altitudes and deep slopes that enhance water’s transgressive power. At the same time, most crops rely on irrigation, which makes water management a fundamental aspect of Andean social organization and a key to power in the region (Boelens, 2015; Gelles, 2000; Guillet, 1992; Las & de Coporaque, 1994; Mitchell & Guillet, 1994; Rasmussen, 2015; Trawick, 2003a). As the first pan-Andean empire the Inca state commanded the administrative capacity and mustered the resources and labor it requires to construct large water infrastructures. Some of them are still in use which underscores the continuity of Andean water management and illuminates the intricate relation between water, technology, and power in the Andes (Latour, 2011; Tsing, 2014). In a broader perspective, the magnitude and persistence of Andean water infrastructure remind us of the inherent drive toward the centralization of decision-making and political control in large-scale water management systems particularly in areas suffering from water scarcity (Annan, 2011; Lansing, 1991; Swyngedouw, 2004; Wittfogel, 1981). The tension that such control creates between the authorities who manage the water supply and distribution, the programmers who design and execute the construction and maintenance of the water infrastructure, and the users who receive and consume the water imbues Andean political history. On one hand, water management implies a political structure. Centralized political institutions are necessary to allocate resources to construct and maintain water infrastructures, define the rules of water management, and solve disputes between its stakeholders. On the other hand, water users often oppose external political interference in local affairs and defend their own rights to manage water (Paerregaard, 1994, 2013a; Paerregaard, Stensrud, & Andersen, 2016; Trawick, 2008). By the same token, discords between water programmers and engineers, on one hand, and, on the other, water users are common. While it is the task of the former to measure water volume, fix water, and direct it to where it is needed, it is the concern of the latter how to access water, assure its quality, and time its flow (Andolina, 2012; Stensrud, 2014a).

Water rights and water values are therefore contested issues in regions that suffer from water scarcity and where the ruling classes attain political legitimacy by mastering not only water’s transgressive power and constructing efficient water infrastructures but also water’s transmutable power and predicting its accessibility. Peru is a case in point of this connection

between water and power. The Incas built their hydraulic expertise on astronomic wisdom and climatic knowledge, which their programmers and engineers used to anticipate water's transformations and its future appearances and flows (Zuidema, 1986). Like in the notion of modern water the hydrologic cycle constituted a fundamental force in the Inca cosmology, which united the world's different realms and linked its many local water sources and flows in a single system (Linton, 2010; Strang, 2015). And as in "modern water" that presents the hydrologic cycle as an abstraction from the histories of places and societies where water emerges, flows, and is consumed and that views water as a discrete resource that can be exploited and manipulated (Linton, 2014; Swyngedouw, 2009a, 2015). The Incas construed the circulation of water as a relation of reciprocity between the water users and the mountain deities who control the flows of water and who demand offering gifts to release it. In this cycle, the Incas configured water's transmutable power as a metaphor for their own political might as well as their superior status as mediators between the human and nonhuman realm. After the conquest, the Spaniards revived the Incas' hegemonic image of water by allowing indigenous water users to continue paying tribute to the mountains deities in return for their acceptance of colonial rule and the identification of their new masters with the superior powers that control water (Gose, 2008). Thinking the circulation of water as a hydrosocial cycle, thus, sheds light on processes of not only transformation but also persistency is the relation between water, power, and culture in the Andes.

Contemporary ethnographies reveal that the Inca model of the hydrologic circle still informs water management in many Andean communities and that Andean people continue to attribute water's transmutable power to the mountain deities and appease these by offering them gifts (Bastien, 1978; Isbell, 1978; Paerregaard, 2013b; Stensrud, 2016a). Similarly, scholarly works report that Andean people read the symbolic meaning that derives from water's aptness to unit and connect as well as dissolve and disconnect as proof that water is a living matter with the ability to think, learn, and react which can be called upon when needed (Paerregaard, 1997, 2013c; Valderrama & Escalante, 1988). Some studies also show that water infrastructure and management constitute a fundamental principle for the political organization and cosmological structure of many communities that give irrigation canals names and associate them with their social histories (Guillet, 1992; Mitchell & Guillet, 1994; Paerregaard, 1997, 2013c; Rasmussen, 2015; Valderrama & Escalante, 1988). These insights suggest that water's transparency induces Andean people to associate it with transcendental and metaphysical aspects of life and coin water justice as a question of not only legal or human rights but also cultural values and ethics (Farhana & Loftus, 2015; Groenfeldt, 2013). As Groenfeldt points out, "Values and ethics pervade water governance both through decisions about the governance regime itself (values about governance in general which are applied to water governance as well as other forms of governance), and through decisions about how water should be used (values about water)" (Groenfeldt, 2013, p. 107). The central importance of water values and ethics is particularly evident in indigenous people's struggle to preserve collective rights to water sources and irrigation canals they have inherited from their ancestors and managed autonomously for centuries (Blaser, 2013; Cruikshank, 2005; de la Cadena, 2015). Nevertheless, as in other places (Blaser, 2013; Cruikshank, 2005; de la Cadena, 2015; Farhana & Loftus, 2015), the Andean water crisis and the neoliberal policies that aim to privatize the region's natural resources have put these customary and often informal entitlements to water and its infrastructures under pressure and made the right to access, allocate, and consume water highly charged questions, politically as well as morally (Bakker, 2012; Boelens, 2009, 2014; Derman & Ferguson, 2003; Galaz, 2004; Limbert, 2001; Roa-García, Urteaga-Crovetto, & Bustamante-Zenteno, 2015; Stensrud, 2016b; Trawick, 2003b; Trawick, Reig, & Palau Salvador, 2014).

4 | ANDEAN HYDROSOCIAL HYBRIDS

Water scarcity is nothing new in the Andes where both the Spaniards and their predecessors built their empires on the control of water. Global warming and glacier melt, however, have exacerbated the region's chronic water shortage and generated a water crisis. Even though it is glossed as a natural phenomenon in public discourse, the water crisis covers a host of social and political circumstances that all contribute the region's environmental tensions. These problems or hydrosocial hybrids as Linton prefers to call them become prevalent in the form of water pollution, water disparity, and overexploitation of hydro-systems causing social unrest that undermines the legitimacy of the Peruvian state and its monopoly to control water (Linton, 2014; Swyngedouw, 2009b). Popular discontent triggered by water conflicts also paves the way for a critique of "modern water" and the social and disciplinary practices of the hydrological sciences and modern water management technologies it internalizes, which discloses the social and political nature of the hydrological cycle (Linton, 2010). As Linton points out: "While the hydrologic cycle has the analytical effect of separating water from its social context, the hydrosocial cycle represents water as a hydrosocial fact, thus putting people and politics at the center of all water issues." (Linton, 2014, p. 114).

In the Andes, the water crisis spotlights these hydrosocial facts and prompts people to question the hegemonic structures underpinning "modern water," which construe water as a single, measurable, and quantifiable substance that can be contained in a hydrologic cycle separate from its social, cultural, and ecological contexts. But the crisis does not only disturb the hydrological cycle but it also opens for new forms of water knowledge and alternative understandings of the moral economy

of water. As already discussed, water is a driving force in the culture and history of the Andes where it symbolizes political power and is ascribed transcendental characteristics. When defending collective water rights and resisting the state's attempt to introduce new water management practices, Andean people draw on this cultural and historical baggage to contest the hydrological cycle and the water knowledge it embodies (Boelens, 2015; Roa-García et al., 2015). A burning issue in these struggles is the interpretations of the ethics and value of water that often cover radical different perspectives on not only how water is accessed and supplied, claimed and distributed, and valued and taxed, but also how environmental justice and cultural citizenship are attained in a country where water inequity epitomizes social and racial discrimination (Boelens, 2014; Bolin, 2009; Garcia, 2005; Paerregaard, 2016; Paerregaard et al., 2016; Stensrud, 2014a, 2016b). Nonetheless, as the following two case studies illustrate, the convergence and coproduction of water's physical, sociopolitical, and imaginary powers vary widely in the Peruvian Andes depending not only on the settings in which the water crisis unfolds but also the gravity of the water shortage, its material and social consequences, and the way the state and the regional authorities address it.

In some of Peru's rural communities, ongoing out-migration has led to a fall in the demand for water even though the water supply has diminished (Paerregaard, 2013b, 2016). Other communities have benefited from the new water infrastructures the state has constructed and the projects the regional authorities create to alleviate the water crisis and generate new livelihoods. The first case study, which is from Peru's southern highlands, illustrates this situation. It inspects changes in the water governance, water values, and water rituals of the community of Cabanaconde that stopped conducting collective offerings to its traditional water source and introduced a new irrigation management system after it began to receive water from a state built channel (Figure 1). But the water crisis does not only affect Peru's rural communities. Some sections of the country's urban population experience water rationing, water pollution, and rising water tariffs and even though the government has improved the cities' infrastructures to ensure drinking water in the shantytowns popular discontent is widespread in many places (Andersen, 2015, 2016; Ioris, 2012). In some cities, mining contamination, new hydro-infrastructures, and urban waste water outlet deepen the water crisis and incite people to mobilize around environmental issues to express their concern about Peru's hydrosocial hybrids. The second case study exemplifies how this mobilization gains momentum. It examines the recent emergence of a ritual event in Peru's central highlands aiming to honor and pay tribute to Mount Huaytapallana that provides freshwater to the nearby city of Huancayo and its neighboring settings (Figures 2 and 3). The participation in the event is triggered by a growing concern for climate change and its impact on the mountain's glacier and the city's water supply.

4.1 | Hydrological consent: More water, less offerings

Located in Peru's southern highlands Cabanaconde lies in the bottom of the Colca River at 3,300 m. It is one of biggest settlements in the region with a population of 2,842 and more agricultural land than the neighboring communities (Gelles, 2000). Even though Cabanaconde is receiving a growing number of incomers from other rural areas, its population is decreasing due to out-migration. Over the years, this has produced large migrant colonies both inside (Lima and Arequipa) and outside (Washington, DC) Peru that contribute to Cabanaconde's development and invest considerable amounts of money in its fiestas (Paerregaard, 2013d).

Up to recently, Cabanaconde received most of its freshwater from Mount Hualca Hualca (6,025 m.) that not only is the second highest mountain in the region but also constitutes a cornerstone in Cabanaconde's cultural identity (Stensrud, 2014b). A canal leads the melt water from Mount Hualca Hualca to the *campiña*—the largest agricultural area in Cabanaconde—where it is allocated in a dual system from September when the villagers plant their fields to December when

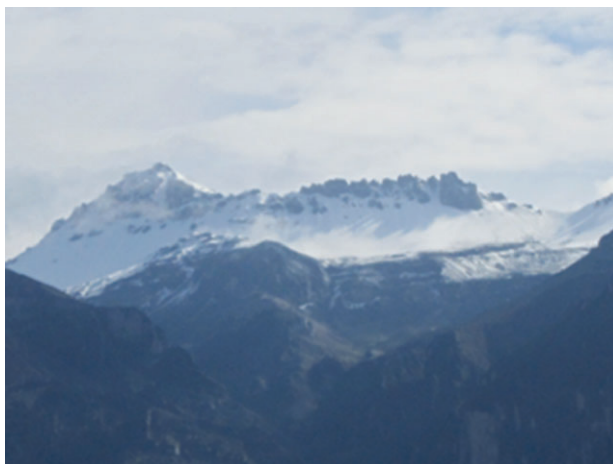


FIGURE 1 Mount Hualca Hualca of Cabanaconde



FIGURE 2 Mount Huaytapallana of Huancayo



FIGURE 3 Offering ceremony to Mount Huaytapallana

the first rain is expected. A labyrinth of smaller canals taps water from the main canal and directs it into first larger zones of cultivable land and then to the individual fields that are irrigated four times during the planting season. The zones are divided into moieties called Hanansaya and Urinsaya that up to recently elected their own water allocators called *regidores*. Starting upstream, the two *regidores* engaged in a fierce competition moving downstream to finish the allocation of water in their moiety first, a showdown that was repeated in the four irrigation rounds (Gelles, 2000). Older villagers recall that water was always scarce and that people fought over the smallest drop of water but they also emphasize that the competition between the two *regidores* ensured efficiency as well as equity in the community's water management. Moreover, they relate that in years of drought water disputes were common between January and April, when the villagers irrigate on a first come/first take basis.

In 1983, the Peruvian state completed the construction of the Majes channel that leads water from the Colca river to the nearby coast and crosscuts the territory of Cabanaconde. The same year the region suffered from a severe drought that caused a water shortage in Cabanaconde and incited a group of villagers to make a hole in the channel to gain access to its water. After an intermezzo with the police, the Ministry of Agriculture granted not only Cabanaconde but also several of its neighboring communities rights to use the channel's water leading to a considerable increase in their water volume (Gelles, 2000). Some of Cabanaconde's newly gained water is directed into the *campiña* that no longer relies on the melt water from Hualca Hualca. The rest is used to irrigate over 1,000 ha of abandoned terraced fields. The land recovery has increased the average seize of the villagers' fields from one to two hectares of irrigated land. It has also generated new incomes and boosted the expectations to the future although the environmental consequences of the community's growth and the new lifestyles it brings about is the cause of concern of many villagers (Paerregaard, n.d.).

Thirty-five years ago, the villagers saw the state as an opponent. Thanks to the Majes channel they now view it as an important ally. The channel has enhanced Cabanaconde's water volume and offered it a regular and stable water supply. As a result, the community no longer depends on its traditional water source, Hualca Hualca, whose melt water varies from year to year and therefore is unreliable. Senior villagers relate that the entire community used to walk to Hualca Hualca's summit every year to make offerings to the mountain and ask it for water. In years of drought, they even did it twice (Gelles, 2000). But Cabanaconde did not only stopped this practice after it began to receive water from the channel but it also replaced its

own community irrigation model with a state model. Rather than working for free the *regidores* are now contracted by the community's irrigation committees and remunerated by the water users (Paerregaard, 2013a). Cabanaconde's shift from a community model to a state model is supported by Peru's water law from 2009 which defines the state as the proper owner of not only the country's water sources but also all its water infrastructures. The law also stipulates the creation of a new institutional framework for water management in the country and encourages Peru's rural communities to introduce remunerated *regidores* as Cabanaconde has done (ANA (Autoridad Nacional del Agua), 2010; del Castillo, 2011; Paerregaard et al., 2016).

The Majes channel prompted Cabanaconde to change perception of political power and engage in a relationship of cooperation rather than resistance with the state. It also led the community to abandon the belief in the Andean hydrosocial cycle that ascribes the circulation of water to humans' reciprocal acts of exchange with nonhuman forces and to subscribe to the notion of modern water. By doing so, the community recognized the Western hydrosocial cycle and the scientific knowledge it builds on.

4.2 | Hydrological dissent: Less water, more offerings

Cities relying on melt water from Peru's glaciers are particularly affected by the country's water crisis. According to Peru's Ministry of Agriculture and Irrigation, Peru has already lost 22% of its glaciers and 12% of its freshwater volume (ANA, 2014). Among the cities that suffer from the consequences from the country's glacier retreat is Huancayo that with a population of 330,000 is the largest urban settlement in Peru's central highlands and the country's sixth biggest city. During the dry season, more than 50% of its freshwater supply relies on the Shullcas river and the glacier of Mount Huaytapallana (5,557 m.) that feeds it (Altamirano, 2014). Competition with the neighboring rural communities and towns over Huaytapallana's freshwater supply adds fuel to Huancayo's environmental crisis and since 2005, the authorities have been rationalizing the drinking water in some parts of city. It is expected that in 2030 the water shortage will affect up to one third of its population (Gomez & Santos, 2012). Another concern is the danger of glacier lake outburst. In 1989 and 1990, outburst from Lazuntay and Huaytapallana's other glacier lakes produced floodings that reached Huancayo and caused panic in the city. The quality of Huancayo's water supply makes up a third concern. Peru's Ministry of Energy and Mining has recently granted permission to a company to explore mining options in four places on Huaytapallana. Moreover, pollution from illegal exploitation of natural resources such as marble and sand on Huaytapallana and local fish farming along the Shullcas river endangers the city's freshwater supply.

The growing number of tourists and pilgrims who visit Huaytapallana makes up yet another threat to its environment. Huaytapallana has always received visitors but up to recently these mostly came from the nearby rural communities that pay tribute to the mountain to ask for permission to use its hillsides to grass their animals. In the past two decades, Huaytapallana has also become a point of gathering for urban pilgrims. In 1994, a group of Andean shamans based in Huancayo started to organize offering ceremonies at the foot of Huaytapallana's glacier and today more than one thousand people from not only Huancayo but also other parts of Peru participate in the event. During the ceremony that takes place on June 21, that is, the Andean New Year, people make offerings, which they burn while asking Huaytapallana for personal favors and fortune in economic affairs. Some also bath in the mountain's glacier lake and cut chunks of the ice which they regard as sacred and believe brings luck even though Huancayo's regional government has banned such activities to protect Huaytapallana's environment. For others, the event is an invitation to contemplate Huaytapallana's glacier at a close distance and express their concern for its future.

Unlike regional cults in other parts of the Andes that are driven by a dual belief in Andean and Catholic images (Salas Carreno, 2014; Sallnow, 1987), the shamans who lead the ceremony on Huaytapallana emphasize its pre-Hispanic roots by saying most of their prayers in Quechua (the dominant native language in the Andes) and using Andean symbolism to galvanize the event. Moreover, by associating the offering ceremony with the celebration of the solstice, the organizers not only draw on a long practice of mountain adoration in the Andes but they also link the event to the current revival of Andean culture in the region. Paying respect to Huaytapallana and claiming an Andean identity, they contend, is one and the same thing. In a similar vein, the shamans point out that only by living according to Andean traditions can Huaytapallana's environment be protected. Talking in Quechua, the leading shaman of the ceremony deplores the harm humans inflict on Huaytapallana by contaminating the environment and causing the melt of its glacier. He refers to the mountain as a person whose heart "is bleeding," who "is sad" and who "is crying." Other participants use the offering ceremony as a platform to criticize government's neoliberal policy and blame the transnational mining, logging, and oil for Huaytapallana's glacier retreat. They see Huancayo's water crisis as a symbol of a political struggle to both reclaim Andean culture and protect the mountain's environment. As one of the founders of event state: "Without Huaytapallana Huancayo will die!"

Up until recently, Huancayo's population worried little about the prospects of Huaytapallana's glacier and its importance for the mountain's hydrological cycle, which they assumed was a natural phenomenon unaffected by human activities and

political decisions. Clean freshwater was simply something that came out of the tap. Global climate change and its impact on Huaytapallana's glacier have changed Huancayo's notion of water and caused an awareness of hydrological hybrids. It has also triggered a growing interest in the offering ceremony on June 21 which teaches the pilgrims that the circulation of water is embedded in not only social and political networks but also a relation of mutual exchange between nature and humans. In the words of the shamans, this relationship constitutes a fundamental element of Andean culture that modern society has neglected but that needs to be revived to solve Huancayo's environmental problems.

5 | WATER AS "A TOTAL HUMAN-MATERIAL FACT"

The two cases point in opposite directions. The first shows how a rural community changed its traditional irrigation practice for a modern water management model after a state built channel enhanced and stabilized its water supply. The second case, on the other hand, demonstrates how an urban movement introduced the same kind of offering ceremony that the community in the first case stopped practicing in response to an emergent water shortage. These insights shed light on the complexity of Peru's water crisis and its impact on the country's rural and urban population and, in more general terms, the relation between water and power. They illuminate how water's properties in a situation of scarcity shape important aspects of social organization, political negotiation, and cultural imagination thus recalling us of the need to study water as "a total human-material fact." In the two cases, water's *transgressive* power and ability to separate and join not only water flows but also political processes have caused a major shift in the social order. Building the Majes channel was a powerful demonstration of the state's capability to tame and contain water, which has contributed to Cabanaconde's prosperity and unity and led the community to recognize its political authority. In Huancayo, on the other hand, disruptive water flows in the form of either water shortage or flooding have affirmed people's sense of insecurity, inflamed environmental conflicts, and disclosed the regional authorities' organizational and political impotence. More bluntly, the cases show that water's agentive power can both generate and subvert political power.

At the heart of the two cases is water's unpredictability and the diverging ideas about the hydrological cycle its *transmutable* power gives rise to. Both cases demonstrate that in hydraulic societies suffering from glacier melt, unreliable precipitation, and unstable water supplies knowing how to anticipate and manage the circulation of water is the key to social power. Cabanaconde's shift from a water management model based on collective rights and the idea of water as a common good to a model based on individual rights and the notion of water as an economic asset suggest that the community recognizes not only the state's superiority but also its hydrosocial cycle as water's explanatory paradigm. Huancayo's environmental movement is also revisiting its notion of water but in opposite terms. Even though the city's population has paid for the use of water for a long time, people used to perceive it as an unlimited good. The water crisis, however, has created an awareness of Huancayo's vulnerability and prompted many to review their understanding of "modern water" and the social and political forces that move it. The ceremony on Huaytapallana offers them an opportunity to reflect on their own position in the circulation of water and question the established knowledge about its transmutations.

Finally, the material suggests that water knowledge is highly contextual and that environmental and political change may lead water users to subscribe to not only different hydrosocial cycles but also divergent belief systems to account for water's *transparent* qualities. At stake in these belief systems are the symbolic reading of water's power and shifting polities' use of this reading to forge hegemonic orders and legitimize social hierarchies. Seemingly, the two cases have little in common except that they represent contrasting movements in knowledge and belief systems. Thus, even though some villagers continue to make tributes to water springs and canals on an individual basis Cabanaconde has stopped conducting collective offerings to Hualca Hualca, which suggests that the Majes channel has instigated the community to change not only its view of the state but also its notion of the hydrological cycle. By reverse, since the shamans of Huancayo began to celebrate solstice and organize the offering ceremony to Huaytapallana two decades ago it has drawn the attention of a growing number of people who see the mountain and its melting glacier as emblematic of the city's environmental problems. Many attribute these not only to their own modern lifestyle but also to an inefficient and corrupt political system and in their quest for answers to Huancayo's water crisis they turn their eyes toward Huaytapallana.

The two cases suggest that ritual practices and religious imaginaries related to water are embedded in political structures and the knowledge systems that sustain them. Before the construction of the Majes channel, Cabanaconde resisted the State's interference in community affairs and drawing on an Inca hegemonic tradition of mountain adoration it conducted annual offerings to Hualca Hualca, which it regarded as its protecting power. Rather than paying tribute to the mountain deities, the villages now remunerate *regidores* to irrigate their fields. The authorities of Huancayo, on the other hand, have charged a water tariff for many years but the citizens' discontent with the city's water service and distrust of the political

system have led many to revise the scientific knowledge that informs modern water management. Instead, they now participate in Andean ritual practices and acknowledge the Inca hydrosocial cycle.

6 | CONCLUSION

As earth, air, and fire, water is of existential importance of human life. However, unlike the three other archaic elements, and beyond the scope of imagination of the classic Greek thinkers, freshwater is now the object of a global environmental crisis unprecedented in human history. Yet this should not lead us to forget that water management and hydrological systems have always been critical for the formation of regional polities such as the Inca Empire in Peru and the hegemonic structures they have employed to legitimize their rule. The knowledge regimes and cultural imaginaries that these polities have created to account for the hydrological cycle all draw on water's fundamental features that encompass its physical power and defiance of control, its capacity to unite and dissolve, and its translucent and transcendent character. As the two cases discussed in the article reveal, these properties are the target of ongoing negotiations and contestations between rulers and ruled who ascribe both converging and opposing political, social, and cultural meanings to the resource they all rely on: water. Water struggles in the Andes are in many ways conspicuous but when explored as a "total human-material fact" they show something universal about water, which is its unique quality to represent raw physical power, malleable social and political power, and soft imaginative power at one and the same time. As the global water crisis deepens and the demand for water equity and water justice grows, it's critical to remind policymakers and planners of how these properties shape almost all aspects of social life and, even more importantly, how their convergence transforms water into a "total fact" giving rise to new political alliances, new social movements, and new forms of environmental awareness.

CONFLICT OF INTEREST

The authors have declared no conflicts of interest for this article.

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