

Stensrud, A.B. 2019. The formalisation of water use and conditional ownership in Colca Valley, Peru. *Water Alternatives* 12(2): 521-537



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## The Formalisation of Water Use and Conditional Ownership in Colca Valley, Peru

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**ABSTRACT:** This article discusses the production and negotiation of water ownership among peasant farmers in the Majes-Colca watershed in southern Peru, where the public water administration initiated a process of formalising user rights for potable water in 2011. While a large-scale irrigation project channels water from the headwaters to export-oriented agriculture in the desert, the supply of water is getting scarcer because of climate change. The Peruvian water resources law from 2009 acknowledges water as public property, yet emphasises its economic value and encourages private investment. The farmers in the highlands see water not only as a resource but also as a life-giving force provided by the mountain-beings to the humans living in their domains. Seeing ownership as an ongoing and dynamic process, and 'commoning' as made by practices of nurture, the article argues that conditional forms of ownership emerge from relationships of reciprocity between humans and other-than-human beings. These are modes of ownership that exceed the dichotomies of private-public, commons-commodity and subject-object.

**KEYWORDS:** Water, ownership, formalisation, the state, nurture, Andes, Peru

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### INTRODUCTION

Water ownership is often seen to oscillate between public and private – the commons versus commodity. This article suggests that water does not fit well in this dichotomy; it tends to overflow and disrupt such categories as public-private, nature-culture and living-nonliving. In the Majes-Colca watershed in the southern Peruvian Andes water supply and water access are becoming more irregular and uncertain for various reasons. The effects of global climate change are experienced as disappearing glaciers, irregular rainfall and drought. Since the 1970s water has been dammed in the Colca headwaters and channelled through Colca Valley and down to the Majes Irrigation Project (MIP) in the arid flatlands of Majes. The 2009 Peruvian water resources law acknowledged water as public property yet emphasised its economic value and encouraged private investment. Where the modern state and corporations only see the economic value of water, other practices – particularly in the highlands – enact water as a life-giving force that is provided by the mountain-beings to the people living in their territories. Water does not flow by itself; it has to be guided, domesticated and channelled, and this involves investment and work of different kinds: offering gifts in relations of reciprocity, constructing and maintaining infrastructure, organising distribution, regulating access and sharing food and drink. Scholarly work on hydro-social relations has shown that water and social relations co-constitute each other (Linton, 2010; Budds and Hinojosa, 2012). This article proposes that, in Colca Valley, water and its users are also part of a mutual composition of place, as in the concept of being 'in-ayllu', which describes how "humans and other-than-humans are inherently connected" (de la Cadena, 2015: 101) and their relationship is also part of them (ibid: 102). In other words, hydro-social relations are within the practices and relationships in which people, land and water co-constitute each other.

Inspired by Brightman et al. (2016) and Blaser and de la Cadena (2017), this article conceives of ownership and the commons as an ongoing process, always in the making, and 'commoning' as practices of nurturing relationships. Earlier work on the formalisation of water user rights has focused on the economic-political relationships between the state, the market and the water users (see for example Seemann and Boelens, 2014; van Koppen et al., 2014; Alba et al., 2016; Seemann, 2016). This article proposes that the complexity of policy implementation can be better understood by learning how ownership is differently perceived and practised according to context.

In addition to legal and regulatory stipulations it is important to look at practice: what bureaucrats and different water users actually do (Andersen, This Issue). As property claims are continuously remade and re-enacted they are open to surprise and complexity (Blomley, 2013). This article will argue that farmer practice in highland Colca produces specific forms of ownership – processual, dynamic and conditional – that emerge from the collective investment of labour and nurturing and reciprocal practice in social relationships, including human-environment relations. These are modes of ownership that exceed the dichotomies of private-public, commons-commodity and subject-object. This article particularly deals with processes in the formalisation of water and the tensions and negotiations that are involved. It suggests that opposition and disagreements are often generated in encounters where different notions of 'nature' and ownership are included without explicitly acknowledging the discrepancies.

The analysis in this article is based on qualitative data generated by 13 months of ethnographic fieldwork in 2011, 2013 and 2014 in several towns and villages in the Caylloma province of the Arequipa region in southern Peru. The majority of the time was spent in Colca Valley, with visits also to the highlands of Caylloma and the Majes Irrigation Project, where the main office of the public water administration of the watershed is located. The primary method was participant observation among peasant farmers and state officials, in organisations, bureaucratic offices, agricultural fields and households. Interviews complemented the observations of everyday work and family life. I cooperated closely with user organisations and public water offices, and conducted approximately 65 formal interviews with local authorities, leaders of water user associations and state officials, agronomists, hydraulic engineers and farmers, in addition to informal interviews and conversations with engineers, farmers and villagers.

The following sections will begin with a presentation of the anthropological theories of ownership, property and the commons followed by an examination of Peru's water legislation and formalisation policies. There will then be a discussion of irrigation management and the different forms of payment among farmers in Colca Valley before the case study of the formalisation of potable water in two Colca villages. Finally, there will be an analysis of the ways water ownership is negotiated and produced in Colca.

### **ANTHROPOLOGICAL PERSPECTIVES ON OWNERSHIP, PUBLIC/PRIVATE PROPERTY AND THE COMMONS**

The notions of ownership and property have been discussed for a long time in the social sciences, and neither lawyers nor philosophers have come up with conclusive, universally accepted definitions (Hann, 1998: 4). In Western legal traditions the concept of property has been defined in a variety of ways: as things, as relations of persons to things, as person-person relations mediated through things and as a bundle of abstract rights (Verdery, 2003: 14). In the *Age of Enlightenment* the English philosopher John Locke (1632-1704) proposed the establishment of property as appropriation through labour: for example, that the cultivation of land justifies ownership over it (Busse and Strang, 2011: 3). Locke imagined a world with plenty of unused land for "industrious and rational" men: "labour, in the beginning, gave a right of property, wherever any one was pleased to employ it upon what was common, which remained a long while the far greatest part, and is yet more than mankind makes use of" (Locke, 2002: 20-21). However, Barbara Arneil (1996) has demonstrated that Locke's theory of appropriation in his *Two Treatises*

contributed to the legitimization of colonisation. The chapter on property in the Second Treatise, "was written to justify the seventeenth-century dispossession of the aboriginal peoples of their land" (Arneil, 1996: 2). Eighteenth-century philosophers, such as Hume, Rousseau and Kant, on the other hand, argued that property should be based on prior possession or occupation rather than labour (Busse and Strang, 2011: 3). This notion of individualised private property was a decisive factor in the rise of modern civilisation and capitalism (Macfarlane, 1998). In today's capitalist society there is an ideological predominance of individual private property, in which the public and moral aspects of property relations shrink and considerations of short-term gain overwhelm long-term values (Hann, 1998: 33).

There is, however, considerable scholarly work questioning how ownership is made. Carol Rose (1994) has shown that possession can be seen as an act of communication. Hence, property is made in historically specific symbolic systems and must be understood in a socio-cultural context. In anthropology, property relations have usually been seen as social relations between people with respect to things (Hann, 1998; Verdery, 1998, 2003). To facilitate comparative analysis, Chris Hann proposes a more open-ended understanding, where "the word 'property' is best seen as directing attention to a vast field of cultural as well as social relations, to the symbolic as well as the material contexts within which things are recognised and personal as well as collective identities made" (Hann, 1998: 5). Similarly, Verdery argues that "property is best analysed in terms of the whole system of social, cultural and political relations, rather than through more narrowly legalistic notions such as 'rights' and 'claims'" (Verdery, 1998: 161). Busse and Strang (2011) prefer to use the wider term 'ownership', which they understand as "a set of processes through which people assert and contest rights rather than a static bundle or structure of rights" (Busse and Strang, 2011: 4). Indeed, the term 'ownership' would seem best suited to accommodating different hydro-social and ontological relationships and nuancing the existing literature on control, property relations and formalisation.

Several scholars have studied the aspects of power in state control and privatisation of water (see for example Bakker, 2010; Swyngedouw, 2015; Strang, 2016). In Andean Peru various scholars have analysed relations between the state and peasant communities regarding the management of irrigation water (Paerregaard, 1994; 2013; Gelles, 2000; Boelens, 2015; Rasmussen, 2015). Recently several scholars have also studied the impact of corporations and how the agro-export boom has led to new hydrosocial territories, water scarcity and social inequality (Damonte et al., 2016; Damonte and Boelens, 2019; Stensrud, 2019a). Others have researched water right formalisation in the highlands and analysed how it strengthens the capitalist market economy and increases social inequality (Seemann and Boelens, 2014; Seemann, 2016).

According to Karen Bakker (2010), policy debate tends to rely on the assumption that the distinction between public and private equates with that between governmental and nongovernmental. Conventionally, the latter category is held to be synonymous with market activity for profit. However, simple public-private dualisms break down when confronted with the complexity of water supply provision in the South, especially in poor urban areas (see for example Andersen, 2014; Anand, 2017). As Bakker (2010) reminds us, property rights may be absent, informal or customary, and governments have never provided universal public services. Unregulated alternatives spring up, and people organise to provide themselves with the water-supply services that their governments are unable or unwilling to provide. All of these are 'private' in the sense of nongovernmental strategies for providing services for and by members of the 'public'. Hence, the distinction between public and private is often unclear (Bakker, 2010: 27-29). For example, water can be officially public yet subject to commodification. On the other hand, it can be 'privately' controlled by a collectivity or community. Water can also be conceived as a vital force or as a living being yet at the same time be used for consumption and production. Bakker (2010: 30) has pointed out that privatisation is a process of market expansion that creates new property relations, thereby generating new society-nature relations. The commodification and 'enclosure' of communal land and water is a much commented upon phenomenon that has wreaked havoc in many places of the world. Water-grabbing has been defined as a situation where powerful actors are able to

take control of, or reallocate for their own benefit, water resources already used by local communities or feeding aquatic ecosystems on which their livelihoods are based (Mehta et al., 2012: 197).

Enclosure does not only involve grabbing water as 'resource' but can also imply a politics of nature and diverging conceptualisations of the ontology of water. In other words, to fully understand enclosure, commodification and formalisation, scholars should not take for granted what water is but acknowledge that it can have many natures (Bonelli et al., 2016; Stensrud, 2016a). Blaser and de la Cadena (2017) have noted that there seems to be a paradoxical conceptual convergence between extractivist governments' justifications for the enclosure of commons and environmental and social justice justifications for a defence of the commons, regarding the 'common good', since they are based on an ontological discontinuity between humans and nonhumans. Blaser and de la Cadena (2017) propose the concept of the 'uncommons' so as to disrupt the idea of the common world as a shared ground and to accommodate other-than-humans. The commons are conceived as ongoing and always in the making, and 'commoning' is a process of creating and nurturing community. Similarly, Brightman et al. (2016) have recently argued that the notion of ownership in Amazonia is intrinsically bound up with processes of nurture. Seeing that objects in Amazonia can have subjectivity and agency, they note that "once we set out to investigate alternative regimes of ownership, different ways of establishing relations between persons and things surface" (2016: 10). This article will next discuss how water is regulated by Peruvian legislation and then how access to water is entangled in human-nonhuman relationships, which can contribute some nuance to analyses of formalisation policies based on individualistic concepts of private property.

#### PERUVIAN WATER LEGISLATION AND THE FORMALISATION OF WATER USE

Water was nationalised in Peru with the 1969 General Water Law enacted by the left-wing Velasco regime (1968-1975) (del Castillo, 1994). Today, water is still acknowledged as public property and national heritage. However, since 1975 neoliberal policies have by and large come to dominate Peruvian governments (Klarén, 2000). In 1989 responsibility for the operation, maintenance and administration of the irrigation infrastructure was handed over to the water users' boards or *Juntas de Usuarios*. To finance this work the Juntas were authorised to charge a tariff and increase it so as to have financial autonomy from the state (Oré and Rap, 2009). In the following decade the neoliberal Fujimori government (1990-2000) made several attempts to pass a new water law that would privatise water and create a water market, inspired by the Chilean Water Code that was actively promoted by the World Bank and the Interamerican Development Bank. This process towards the commodification of water was part of a global trend that was clearly articulated in the 1992 Dublin Statement, which declared water as an economic good (Franco et al., 2013). In the end the law to privatise water was not enacted due to strong opposition from irrigation organisations (Oré and Rap, 2009; Oré et al., 2009: 52-53). Nevertheless, neoliberal thought continued to influence water governance policies during the governments that followed Fujimori. This implied the fostering of individual property rights, the treatment of water as an economic resource and the prioritisation of economic growth and capitalisation as the means to progress.

The Peruvian economist Hernando de Soto, head of the Institute for Liberty and Democracy (*Instituto Libertad y Democracia*), had considerable influence on economic policies in Peru in the 1980s and 1990s, and his ideas have also been influential all over the global South and within the World Bank. De Soto addressed the need for simpler and more universal legal systems: "a good legal property system obtains and organises knowledge about recorded assets in forms we can control" (de Soto, 2000: 218). Secondly, he proposed the formal titling of property in order to activate the potential value in an asset. In his view, legal property "assigns to assets, by social contract, in a conceptual universe, a status that allows them to perform functions that generate capital" (de Soto, 2000: 221). He promoted the formalisation of assets as a way for poor countries to achieve capitalist development. In this scheme it is taken for granted that all humans act as 'homo economicus' on an even playing field; farmers, mines and agribusiness companies are equal players.

Inspired by these ideas, the Peruvian government started to formalise not only land property but also user rights to water. The government programme for the formalisation of water rights PROFODUA (*Programa de Formalización de Derecho de Uso de Agua*) began by formalising agrarian water uses in 2004. In 2008 all water-related management was centralised in the National Water Authority ANA (*Autoridad Nacional de Agua*), with offices in the capital, Lima, in an effort to make management more efficient. The ANA is subdivided into regional Administrative Water Authorities (*Autoridad Administrativa del Agua – AAA*), referred to as 'triple A', and Local Water Administrative offices called ALA (*Administración Local del Agua*). With this centralising reform the management of all kinds of water and uses – not only agricultural but also industrial and domestic use – were gathered in ANA.

In 2009 the García government passed the Water Resources Law (*Ley de Recursos Hídricos*), which was tailored to meet neoliberal interests by promoting the role of the private sector in economic and social policy (del Castillo, 2011). The law emphasises the economic value of water and the need for efficiency and modernity in water management (ANA, 2010). Although the law still explicitly acknowledges water as state property, it has been adapted to a neoliberal project that induces the state to downplay its role in economic and social politics. Hence, the law gives ample space for private companies to intervene and invest in water management (del Castillo, 2011).

The Water Resources Law stipulates that all water use in Peru, including agricultural, industrial, mining and domestic usage (drinking water), as well as the management of wastewater, be formalised (ANA, 2010). Yet it covers a territory that is differentiated economically, politically and culturally, and its implementation is highly contested due to the variance in valuing, managing and practising water allocation (Paerregaard et al., 2016).

## IRRIGATION IN COLCA AND DIFFERENT FORMS OF WATER PAYMENT

The environment of Colca Valley is semi-arid, which makes agriculture extremely difficult without irrigation. The landscape is testimony to this due to the centuries-old agricultural terraces and old and new irrigation canals. Several anthropological studies have analysed local systems and practices of irrigation (Guillet, 1992; Guillet and Mitchell 1994; Paerregaard, 1994; Treacy, 1994; Gelles, 2000; Vera 2011). Making irrigation systems work requires the maintenance of physical infrastructure as well as maintaining different kinds of relationships and negotiating between water users, villages and the mountains and springs that supply the water. The work of the 31 irrigation associations of the valley, called water users' commissions (*comisiones de usuarios*), and of the Water Users' Board of Colca Valley (*Junta de Usuarios Valle de Colca*) – often just called *la Junta* – is very important in this regard. Approximately 10,000 smallholding farmers in Colca Valley are organised in these associations. They cultivate potatoes, beans, quinoa, barley and maize on a total of 12,000 ha of land, which means that an average family farm owns 1.2 ha, which is often distributed across several small fields. Although land tenure per family can range from 1/3 to 7 ha, economic inequalities between farmers are relatively small. The main non-agricultural water users in the valley are tourist hotels, and there are some mines in the high parts of the province. The water users who participate in the commissions, however, are all farmers. The water users' commissions are responsible for the maintenance of the hydraulic infrastructure, which constitutes a complex network of hundreds of kilometres of canals and pipes that connect the springs, lakes, glaciers, ponds and small reservoirs with the pastures and fields. The 100 km-long Majes Canal also runs through Colca Valley. It was built in the 1970s to transfer water from the Condorama Dam in the highlands to the export-oriented agriculture of the Majes Irrigation Project near the coastline. The construction of the canal not only cut through mountains, natural springs and streams but also brought social problems and abuse in temporary, low-paid, labour-intensive jobs, and several workers died in accidents (Gelles, 2000). After years of protests and demands from farmers in the 1980s and 1990s the public agency in charge of the Irrigation Project, AUTODEMA (*Autoridad Autónoma de Majes*), agreed to

build valves in the canal from which communities received allocations of water for irrigation (Gelles, 2000; Paerregaard, 2013; Paerregaard, This Issue).

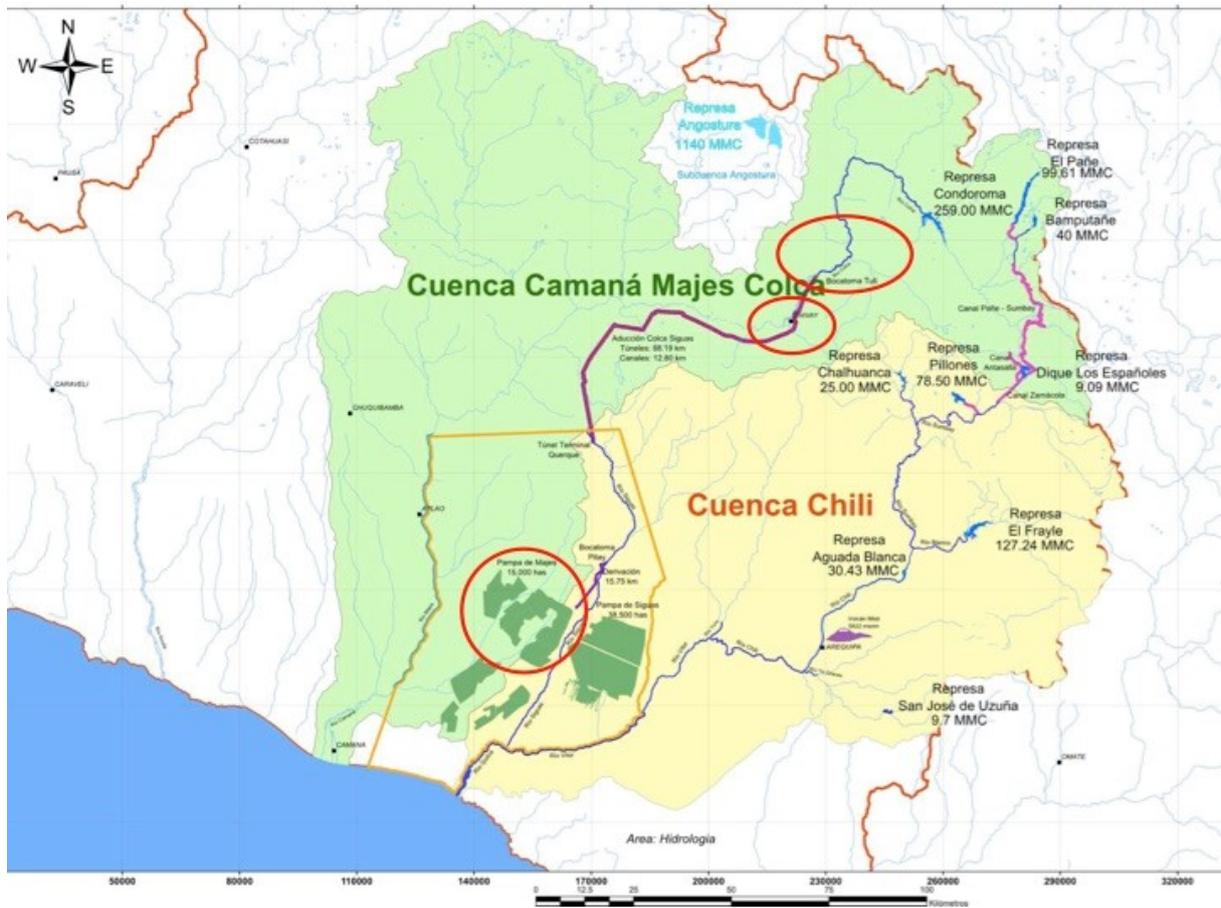
While the large-scale Majes Canal is maintained by AUTODEMA (Ullberg, This Issue), the small-scale infrastructure is built and maintained by collective work parties in which all water users are obligated to participate in order to have the right to use water. Every August, the month before the start of a new sowing season, each association organises the main canal cleaning event (*yarqa aspiy*) of their irrigation infrastructure, followed by festive celebrations. Before the cleaning work begins the water user commissions organise ritual offerings of *pagos*, which are packages of food, coca leaves, herbs, flowers and alcohol that are given to the canals and ponds, as well as to the earth-places where they are located. The springs and mountains – the sources of water – also receive *pagos*. Mountains often receive a dried alpaca foetus in their *pago*, while a spring would be given a dried starfish from the sea in order to increase the amount of water. The *pagos* are made by a ritual expert (*paqu*) accompanied by a group of water users (Stensrud, 2016a). In these practices water is considered a sentient and responsive being with agency. Earlier ethnographic studies in Colca Valley have also described water as a living being (Valderrama and Escalante, 1988). The leader of one Colca Valley water user commission explained that the common name of water is *Yakumama*, meaning 'watermother', but that they also use a more specific name they consider more respectful, *Mama Choqesisá*, especially in ritual contexts in the higher parts of Colca.

Lakes and springs (*qochas* and *pukyos*), as well as the earth, or earthmother (*pachamama*), and mountains, are related to as sentient beings in everyday life and conversations among villagers (see also Brandshaug, This Issue). The mountains are often called *apu*, which means 'lord' or 'chief' in Quechua – a title once borne by the rulers and administrators in the early colonial period (Gose, 1994: 212). The *apus* were described as "the owners of the earth": they are the rulers, guardians and owners of the territories they overlook. An *apu* can, for example, be "the owner of alpacas", while many are sources and 'owners' of water. Some are more powerful than others, and they have varying gender, characteristics and personalities. In addition to occupying different positions in the hierarchy of other-than-human beings in the landscape, the *apus* are also related by kin: they can be relatives, spouses and in-laws (Allen, 1988; Gose, 1994). The *apus* and the other earth- and water-beings are not inherently benevolent or malevolent, but they can be quite capricious and demanding. They demand proper respect and gifts – *pagos* – in return for water, plants, fertility and wellbeing (Stensrud 2019b).

In the 2011 celebration of the World Water Day in Chivay, where all the Water Users' Commissions in Colca Valley participated, the commission that won the banner contest was Chivay Urinsaya. The message they had written on their banner read in Quechua: "Mamacochata sumacta ttincaricusun hashcata yacuta ccohuananchispacc", translated here as "Let us give Mamacocha a good *ttinka* so that she will give us a lot of water". '*Ttinka*' (usually spelled *t'inka*, according to the standard established by the *Academia Mayor de la Lengua Quechua*) is the act of sprinkling drops of alcohol for other-than-human beings, such as a spring, the earth or a mountain. Just as *pagos*, it can further be understood as a communicative and relational world-making practice from which humans and other-than-humans (watermothers and mountain-lords) emerge (Stensrud, 2016b).

With this banner the water users in Chivay Urinsaya communicated the importance of acknowledging Mamacocha as their main water source and reciprocating by offering *t'inkas*. Mamacocha is not only the main source of irrigation water for the farmers in the Urinsaya commission; it also supplies drinking water to the urban population of Chivay – the main town in Colca Valley and the capital of Caylloma province. Twice a year a *paqu* makes a *pago* to Mamacocha to ensure continued water supply.

Figure 1. Colca Valley and Majes Irrigation Project in the Camaná-Majes-Colca watershed (Source: Autodema).



Note: The villages of Tuti and Sibayo are located within the upper circle, and the town of Chivay is in the middle circle. The lower circle indicates the irrigation project in the desert pampa of Majes District, which is irrigated with water from the Condoroma Dam.

Figure 2. The villages of Tuti and Sibayo are located in the high parts of Colca Valley, 20 and 33 km from Chivay, which is the main town in Colca and the capital of Caylloma province (Google Earth).



With the shortened rainy seasons and declining water supplies that farmers have experienced in the past few years, irrigation and *pagos* become even more crucial and in some places they have revived the *pagos* because of climate change (Stensrud, 2016a; 2016c). One example is the *apu* Hualca Hualca – a powerful mountain rising 6025 m above sea level, recognised as the source of water and life for the village of Pinchollo. Having stopped the traditional *pagos* for many years, the custom was started again a few years ago, this time explained by the threat of climate change. As one water user explained, "if the glacier disappears, there is no life anymore; there is no village anymore. The mountain supports us". In October 2011 the villagers walked up to the foot of the Hualca Hualca glacier, where the meltwater starts its descent towards the village, and made *pagos* and *t'inkas*. One of the participants explained: "if there is no water, there is no life. Without Hualca Hualca our village would not exist. That is why we make the *t'inka*" (Stensrud, 2016a).

The gift of water is not permanent and cannot be taken for granted: the relationships of reciprocity and guardianship must be reaffirmed each year through *pagos* and other ritual work. The *apus* can be vengeful and dangerous when they are disrespected or have not received offerings. Hence, living in this place implies taking part in intricate and affective relationships – which can also be violent and dangerous – between humans and mountains, earth and water. Relationships to land and water have to be nurtured in order to ensure water supply and the fertility of land and animals. Through these actions humans are granted the right to use the water emanating from the land. This right is what I call 'conditional ownership'. It is processual and dynamic, and based on nurture and reciprocity. Since water comes from the *apus*, who are its keepers, it also belongs to the territories, and people, of which the *apus* are guardians. This way of explaining belonging and ownership is very different from how property is established according to the state and the market.

In the 1990s the *Junta* of Colca Valley began to charge farmers an irrigation tariff. These are not payments for the water per se, since water is public property by law, but for the use of infrastructure. Since irrigation water is taken from different sources and different kinds of infrastructure, the payments varied. The water coming from natural springs, melt water, streams and lakes was categorised as 'unregulated water' and, as it was gathered and channelled in artisanal ponds and canals, it was the cheapest category. The most expensive tariff was for the so-called 'regulated water' coming from the Majes Canal because the *Junta* pays a part to AUTODEMA for the maintenance of the canal. The difference between unregulated and regulated water rests on the relationship to the state, belonging and 'ownership' of the infrastructure: whether water runs in state-owned infrastructure, like the Majes Canal, or in small-scale canals built by the farmers.

When the tariffs were introduced the *Junta* was met with strong expressions of distrust and opposition among the farmers. Many refused to pay because they saw the water as given by the mountains (see also Paerregaard, This Issue). Why should they pay for something that belonged to them? People receive water from the mountains and reciprocate by 'paying' offerings. These 'payments' do not consist of general-purpose money, however, but food, coca leaves, alcohol and alpaca foetus, which nurture the mountain. Therefore, the monetary payment of the tariff is different. What is similar is the expectation of being part of a mutual, reciprocal relation, which in this case means getting something in return from the *Junta*, such as cement, services and support. This is also the explanation given for why many farmers in most of the Colca water users' commissions today pay the tariff: because the *Junta* has made an effort to generate trust through courses, teaching and support for projects to improve the infrastructure. Miguel, the *Junta's* technical manager, explained that, "we have to give service to the farmers; if we don't, [people] say that the *Junta* does not give us anything and why then should we pay".<sup>1</sup> "Without the tariff we would not have any organisation and no means to repair and improve the canals and water intakes", Miguel pointed out. The *Junta* receives tariffs from all the farmers and distributes the money: a small part to the National *Junta*, a part for the water tax to the state (*canon hídrico*), a part to the local

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<sup>1</sup> All personal names in this article are pseudonyms.

public water administration ALA (called ALA Colca-Siguas-Chivay) and a part for amortisation to AUTODEMA for the use of water from the Majes Canal. A large part was sent back to the commissions for the supply of cement and other materials and the hire of extra labour when needed. The rest was used for daily expenses, office materials and salaries for the Junta's staff (technical manager, secretary and accountant). The presidents of the commissions and the board members of the Junta – who are elected in the general assembly to which all the presidents are invited – work on a voluntary basis. In many Colca villages (with some significant exceptions in Cabanaconde: see Paerregaard, This Issue) the local water allocators (*regidores*) are also unpaid volunteers, although they work hard, especially in the five most critical months between August and December when they spend every day supervising irrigation. These *regidores* are also responsible for organising the *pagos* to the springs, ponds and mountains.

Not only do the springs and mountains supply farmers with irrigation water, they also provide drinking water to the Colca Valley villages. Until the 1980s and 1990s (the late 1990s in the most remote areas) the many villages in Colca Valley collected drinking water from irrigation canals. Today, however, most households have access to potable water and many have installed pipes (Paerregaard et al., 2016).<sup>2</sup> Private international and national NGOs, like DESCO, have in many cases financed projects to construct and improve infrastructure – reservoirs and pipes – to secure safe potable water for the population. In most districts today the municipalities organise the provision and distribution of drinking water. Some villages have elected boards for the administration of sanitary services called JASS (*Junta Administrativa de Servicios de Saneamiento*) or committees called CASS (*Comité de Administración de Servicios de Saneamiento*). In Chivay the public company of potable water and wastewater services in the region of Arequipa, SEDAPAR (*Servicio de Agua Potable y Alcantarillado de Arequipa*), took over the management of potable water in 1977. Since then, however, SEDAPAR has often met with protests because of low water quality and lack of improvements in spite of the increased monthly payments and the meters that have been installed in the households. For example, in 2011 around 800 families organised in a JASS and demanded that SEDAPAR return the administration of the potable water system to "the people".

### INTRODUCING WATER-USE LICENCES IN COLCA VALLEY

After some years of paying both the potable water and irrigation tariffs and getting used to the arrangement, water users faced a new regime of formalisation and licences when the PROFODUA programme began its work in Colca Valley in 2006. Most farmers whose formal land titles were in order now obtained licences as part of large groups called 'irrigation blocks' (*bloque de riego*). Those who did not receive a licence through PROFODUA had to apply on an individual basis for the right to use a specific amount of water (measured in litres per second) from a specific source. The licence holder must also pay an annual fee for the right to use water. In return, ANA promises to protect these individual rights to use water, which is state property. Registration and control require nature to be simplified for ease of measurement, calculation and manipulation. This bureaucratic logic of legibility is practically synonymous with, or a requisite of, commercial logic (Scott, 1998). This means that the complexity of water practices and relationships to water as a sentient being are simplified: water becomes a uniform 'resource' to be exploited for economic gain (Stensrud, 2019b). According to Seeman and Boelens (2014), the introduction of these licences in Yanque (a village in Colca Valley) caused increased individualism and weakened communal water management, which is embedded in collective water rights and obligations. While presented as a way of ensuring water security, the process also increased state control and market mechanisms. Since the licence increased the value of some properties, new social inequalities were created (Seeman and Boelens, 2014). This is exactly what legal property should do, according to de Soto:

<sup>2</sup> One exception is the poor neighbourhood in Chivay, El Mirador, where the inhabitants are landless migrants from other districts who cannot afford – and do not want – to make the initial payment to connect to Sedapar's pipe systems and therefore drink contaminated water from an irrigation canal.

by social contract, in a conceptual universe, assets are assigned a status that allows them to perform functions that generate capital (de Soto, 2000: 221).

In 2011 the local ALA, whose head office was in Villa El Pedregal, the main urban centre in the Majes Irrigation Project, decided to send a representative to be present in Chivay, the main town of Colca Valley, two days a week. The designated employee, José, was not an engineer but a technician with experience in other water-related institutions. Having worked in ALA for just a few months on a temporary contract, José was supposed to attend the Chivay office every Monday and Tuesday and represent the ALA in meetings and inspections as necessary. His job was to provide the link between the local farmers and the ALA, and to coordinate work with the Junta and the water users' commissions.

The first task assigned to José was informing all the municipalities in Colca Valley about the new law and the need to formalise the right to provide their populations with drinking water.<sup>3</sup> These licences for population use were legitimised by the need to secure water for the future in case of climate change, water scarcity or the intrusion of mines, tourist hotels or other market actors. Most district municipalities were highly sceptical and resistant, however, and both water users and local authorities perceived it as another step towards the privatisation and commercialisation of water. José was also in charge of coordinating the visit of another ALA employee, Cesar, who would carry out the inspections, measurements and paperwork for formalisation. José had planned to visit all the municipalities to inform them about the licences and forthcoming inspections and undertook some unannounced visits in June 2011. The following is an ethnographic account of discussions that arose between ALA officials and local authorities concerning the control and ownership of water in the municipalities of Tuti and Sibayo.

## MEASUREMENTS AND PAYMENTS

In the municipal building of Tuti village José from the ALA met the district mayor and two of his council members. He gave them a printed copy of the new water resources law and told them about the licensing of water use rights, which he explained should be formalised, with an annual fee payable to the state. Since this was considered to be an area of extreme poverty, he assured them that the fee would be no more than 200 soles. He informed them that a technician from the ALA, Cesar, would come to inspect the point of water intake (*punto de captación*) and measure the water flow (*aforar*). Hearing this, the mayor got very upset. He explained that the villagers of Tuti had done all the work to construct the infrastructure for drinking water themselves and that the provision of drinking water was organised by a committee known as the CASS (*Comité de Administración de Servicios de Saneamiento*) with members elected by the community. Households in Tuti did not pay for drinking water, and the mayor rejected the idea that they should now pay for a licence. "It starts on 200 soles, and afterwards it will be increasing", he predicted. The district's monthly budget is only 28,000 soles, and there was not enough money for more expenses. "There is no room in our budget. The state should take care of this. We are living in extreme poverty, and this means more expenses", the mayor exclaimed. He could not understand why the state would force a poor district to pay for the right to water. His main objection was that the inhabitants of Tuti had done all the work of obtaining access to this drinking water and were currently undertaking all the maintenance and distribution.

The governor of Tuti was an elderly man who remembered well how the local authorities had worked to obtain potable water thirty years earlier. In the 1980s the community agreed to capture water from a spring in the mountains and install pipes to the village, "at our own cost", the governor proudly stated. They also applied for funding from NGOs in order to buy pipes and other materials. In communal work parties the villagers built a small reservoir in order to capture the water from the spring. "The communal work was like *ayni-minka* – one for all and all for one", the governor said. *Ayni* and *minka* are Quechua

<sup>3</sup> Wastewater treatment was also part of this information and formalisation campaign. According to the new law, all municipalities must obtain licences and use treatment plants to dump waste water.

concepts for labour exchange based on mutual reciprocity (Allen, 1988; Mayer, 2002). Initially, people carried water in buckets from public pumps in the plaza to their houses. Little by little they installed pipes to every house in the village. Then SEDAPAR tried to intervene and take over the management. However, the people rose up and did not allow this state company to enter the district. "The water is our own", the governor explained, and "if we give it to SEDAPAR, they will make us pay every month". Today the potable water is administered by the CASS committee, and one person is in charge of the cleaning of the reservoir, the chlorination and controlling the amount of water that is used. Instead of monthly fees every household pays 15 soles a year to CASS.

A couple of weeks after Jose's conversation with the mayor, Cesar carried out an inspection in Tuti. This time the mayor was not present. Instead, Cesar met with the vice-mayor, a council member, the president of the CASS, the treasurer of the municipality, the vice-president of the Water Users' Commission and the district governor. The council member and the CASS president were women and the rest were men. Cesar started by explaining that water for human consumption (*uso poblacional*) was given priority in the new law on water resources, and that the municipality must apply for a licence to have the right to use the water that they capture from the spring for domestic usage. The licence application, he said, should specify the exact amount that they are using and that they expect to use in the future, with a 20-year projection of population growth. The listeners were sceptical, and the council member talked about their disappointing experience with the formalisation of user right licences for irrigation water. First, the engineers from the PROFODUA programme had told the farmers that the procedure would not cost anything, but those who did not obtain their licences in the first round now had to pay a fee when filing the application. Therefore, people feel deceived and call it a 'business' (*negocio*), she explained. The treasurer asked how the CASS could apply for an exoneration or a minimum payment, and Cesar replied that they could just talk with the officials in the ALA and since this was a poor highland area it could be considered for a minimum payment. The president of the CASS, a woman in her thirties, stated "we have to bring this proposal to the people (*la población*), and they have to accept it or reject it. If [we do] not, they will ask why we have done this without consulting the people!". The governor agreed: "We have to decide this in a meeting (*asamblea*); if not, the people will rise and send the authority away on a donkey". The governor was especially worried that this process would "open the way for SEDAPAR".

"I come here to talk, not to impose", Cesar insisted, and they proceeded with the inspection and walked uphill to the 'capture point' (*punto de captación*), where a water flow rate of approximately 3 litres per second went into a pipe from the spring to the reservoir and the rest entered an irrigation canal. Cesar was surprised that this small amount of water was sufficient for 700 families, and they confirmed that they did not use much water during the day when most were out working in their fields. The conversation continued by the reservoir, under a sign that read "Water is life. Do not waste it". Cesar explained that they should apply for a licence for 3 litres per second in addition to a future projection of population growth. He suggested that they apply for 5 litres per second, and he recommended that they install a measuring valve (*válvula medidora*) in order to pay for the amount they actually use rather than that written in the licence. If they have a licence for 5 litres, but the valve shows that they only used 3 litres, then they would only pay for 3 litres. However, if they do not measure and report this, they would be charged for 5 litres. The CASS president explained that things were a bit more complicated: since the households only use water during the day (mostly in the morning and afternoon), the water is diverted to an irrigation pond at night. Cesar responded that they could calculate their consumption by 12 hours a day instead of 24 in order to pay less. They were not happy with this solution, however, commenting that it would create more control, less flexibility and more conflict. According to the council member, this would start a war between the municipality and agriculture. She pointed out that every afternoon there was an overflow of water from the reservoir that went into another irrigation canal. "We do not waste anything; we make use of everything", she said. Once again Cesar suggested that they install a gauge in the reservoir.

Cesar talked as if the quantity was the issue. He emphasised that, according to his calculations, the minimal fee of 200 soles for the licence, divided among the 700 families in Tuti, resulted in only 28 *céntimos* per family per year. For the community leaders, however, much more was at stake. The conflict appeared to revolve around the qualitative change in water governance: the measurements and licences introduced by the state agencies meant more external control, and the villagers feared that this would escalate and open the way for private companies and the commodification of water. The group of leaders were not calmed by Cesar's calculation, and kept asking for details. For example, would this money cover the chlorination and maintenance of the infrastructure? Cesar explained that no, that would be another payment. He also informed them of a licence application fee of 183 soles – the 'right to procedure' (*el derecho de trámite*) – and a further 300 soles for the 'right to inspection' (*el derecho de inspección*).

The vice-president of the Water Users' Commission stated that he disagreed with paying this money. He compared it with the tariff that all farmers pay for irrigation water; the major part of this tariff is returned to the commission to spend on the maintenance of canals and other things. However, the entire licence fee would go to the state and not be used for the benefit of Tuti. He pointed to the crux of the matter when he emphatically said that "this is the work of the people; we have built it through communal work (*faena comunal*)". The president of the CASS said she had heard that in other villages farmers had refused to pay for licences to use irrigation water. "They come here and they do not say the whole truth", she complained, and lamented that people who wanted to be courteous and correct ended up obeying the state and paying more and more. The governor supported her and told Cesar that there was a "lack of trust" and that people resist payments. Cesar did his best to convince them that they could trust him and that the ANA and ALA had their best interests at heart. He repeatedly emphasised that they should think of their children, since the water sources are gradually drying up because of climate change. Therefore, they should protect their rights before other actors, such as mining companies or tourist hotels, apply for the legal right to that water.

It became clear during the inspection and conversation that a formalisation process is not a simple assertion of rights to access water. While legitimised by a discourse of scarcity and competition, formalisation brings with it a whole host of associated material and social effects, such as valves, measuring technologies and control mechanisms, which also indicate a lack of mutuality, trust and collective responsibility.

What did not come up in the meeting, however, was the relationships with other-than-human beings, like the mountains and springs. These beings tend to be ignored in negotiations between state and citizens, and farmers do not mention them in meetings with officials as they do not wish to be perceived as 'indigenous' – a social category loaded with historically produced stigma.

In internal meetings, however, the beings in the surrounding landscape are taken into consideration. If they are not, the outcome might be tragic, even deadly, as was the case in October 2011, when four water users died in an accident, crushed by huge rocks that fell from a mountain. They were going to do repair work on a canal and the mountain killed them. One was the vice-president of the Water Users' Commission. The night before, the water users in Tuti had discussed the repair work that they planned to do on one of their canals. The vice-president proposed that they make a *pago* offering to the mountain where the canal passed. This mountain was known to be particularly powerful and dangerous: it was said that many villagers were afraid to pass there at night because the mountain could open and lure you inside by showing you a nice market with beautiful things. When the water users built the canal many years ago they had made a good offering to this hill. They said they had given him a human foetus, which was interpreted by some as a big mistake because the mountain got used to the taste of humans and craved more. The vice-president had pointed this out in their meeting, suggesting that they should make a new powerful offering before starting the work. However, the meeting was held late on a Sunday night, and they did not have the right ingredients for a good offering. Most of the water users were eager to start the work the next day, so they postponed the *pago*. Next morning the vice-president and three other water users from the work party were killed by rocks and thus "eaten" by the mountain. The whole

village was terrified, in shock and grief, as they buried the four of them the following day. This was a disconcerting reminder of the power of the mountain, who also sustains the people with water.

### **PRIVATISATION, FORMALISATION AND CONDITIONAL OWNERSHIP**

In the municipality of Sibayo, José presented a shorter and less confrontational version of the information about user licences and made arrangements for Cesar's inspection. Two weeks later Cesar met with the municipal manager and one council member, who was also serving as secretary of the Water Users' Commission. They said they were worried about the declining water supplies: the glaciers and snow had disappeared from the mountaintops and many springs were dry. They took Cesar to the point of capture of potable water: after a 30-minute drive it was a 20-minute walk to the spring, which was located at an altitude of 4381 m. They explained that when the water supply in this spring diminishes in November and December they take water from another spring located 600 m away. The two springs belong to an *apu* who receives *pagos* from the villagers every August and February. The villagers worked together to install a pipe connecting the two springs and a 20 km-long pipeline from the main spring to the reservoir. There the water is chlorinated before being distributed to all households in the village. The municipality organised this work around 20 years ago, and today the households do not pay for potable water.

After the inspection Cesar explained the process of the formalisation of water user rights as stipulated in the new law and about licence fees. He said, "the purpose is not to sanction or create problems. We must talk and find solutions". The council member and the manager asked whether it was possible to pump from the Colca River in order to have more water. They were concerned by the dwindling supplies and future scarcity. However, Cesar explained that the water in Colca River already had an owner. This water comes from the Condoroma Dam, which is located upstream in the neighbouring district of Callalli, and is destined for the Majes Canal, which starts downstream in the water intake (*bocatoma*) in Tuti. The final destination of this 'regulated water' is the desert flatlands of Majes, where 15,800 ha are irrigated. The irrigated area is dominated by large-scale, export-oriented agribusiness and 5-ha family farms that produce either milk and crops for national and international markets (such as onion, peppers and quinoa) or contracted high-value crops for export (such as artichokes). The Majes Irrigation Project is part of the Peruvian government's vision of development, which is based on 'water extractivism' – the practice of singularising and standardising water into the category of 'resource' in order to master it and extract as much economic value from it as possible (Stensrud, 2019b). In the forthcoming second phase – Majes-Siguas II – the irrigated area will be extended by 38,500 ha. A private consortium has obtained the concession to construct a new dam and administer the Majes Canal for 20 years. "We call this privatisation", farmers repeatedly said. Notwithstanding the government's promise that the water will remain public property the farmers fear that the operator administering the infrastructure will control the water flow and increase the water tariff to recover their investment (Stensrud, 2016d).

Although Cesar opened up the dialogue to help water users in Sibayo, their hope of taking water from the river passing their village was out of the question. As a representative of the ALA he also represented the state, which prioritises the needs of agribusiness and export-oriented economic growth. Cesar's goal, by contrast, was to formalise – and enclose in a licence – the use of water that was given by the *apu* to the people of Sibayo. Interpretations vary as to what the formalisation of user rights implies: insurance and support or a strategy to commodify and privatise water. The diverging views reflect different relationships and experiences with the state: those who have experienced it as an employer and protector of rights can easily see the formalisation of rights as insurance for the future. On the other hand, those who, based on previous experience, have reason to distrust state officials and professional engineers, and those who have experienced the state as a colonising power and/or a distant and elusive entity, will be inclined to see formalisation as yet another attempt to mislead and exploit them.

The water resources law, which is legitimised by global climate change and the threat of water scarcity, transfers responsibilities from the state to private Juntas on the one hand and emphasises

formalisation and control on the other. Although more work is given to private user associations, the state imposes more regulations and payments. This creates mistrust among water users, who refuse to be monitored and exploited. Peru's peasant farmers tend to have extensive experience with deception and abuse, making it very hard to trust state officials. Most peasant and indigenous communities and small municipalities prefer to manage their resources in their own way.

When ALA officials say that the licence will protect people against the abuses of private mining companies it is a strong argument. However, many farmers in Colca find it hard to trust that the licence is a guarantee when they also see that the government gives priority to multinational corporations like agribusiness and mines. Most farmers in Colca seem to have a general scepticism of tariffs, fees and taxes, and many express fear that payments will increase and that formalisation is the beginning of the privatisation – in the sense of enclosure and commodification – of water.

Formalisation changes and severs relations between the state, people, *apus* and springs. By formalising and enhancing the state-citizen relationship it simultaneously cuts those between water users, springs, mountains, ponds and canals. These relationships are invisible in the formal documents of licences and ownership.

After a long process the municipalities in Tuti, Sibayo and the majority of the districts in Colca Valley got their formal licences for potable water user rights in order approximately four years after José and Cesar's first visits. José explained the initial conflict as a problem of information. Yet the problem appears to go beyond communication and the exchange of information. The key question for many people in Colca Valley seems not to be about formal property but control over their surroundings, their lives and their future. Who decides how they organise the distribution of water – the source of life – is essential, and most prefer to make their decisions collectively in communal meetings. A further message from Colca was that the sentient beings in the landscape are also taken into consideration when making these decisions.

As Bakker (2010) has noted, there is a clear need to rethink our conventional usage of the terms 'public' and 'private'. Both state and private actors invest in hydraulic infrastructure – large-scale or small-scale – in order to control the water flow, and processes of commoning and commodifying unfold across the boundaries of public and private spheres. The Peruvian state's project to formalise water use rights can be seen as making water use legible and controllable, which can potentially facilitate its commodification. In highland Colca water users invest time and labour in making the water flow; an important part of this work is nurturing the mountains, springs, ponds and canals. The politics of nurture and ownership in Colca consists of many different practices of 'commoning' that villagers engage in. Each water user needs to earn the right to use water by participating in collective work parties and paying tariffs. They also participate in making offerings to mountains and water sources to secure the supply of water.

In short, water user associations in Colca invest time and work in making territory where land, water, humans, mountains and infrastructure are connected in a relational web. From this territorial web emerges a form of ownership that transcends the dichotomies of private versus public, individual versus collective, as well as the possessing subject versus the possessed object (cf. Brightman et al., 2016). Ownership in the Colca Valley is conditional and based on reciprocity: a group of people cannot take ownership for granted even if they occupy the land or territory where water sources are located. Ownership is granted through the reaffirmation of reciprocity and nurture in relations between humans and nonhuman beings like *apus*.

## **CONCLUSION: NURTURING VS. SEVERING RELATIONS**

Classical anthropological understanding of property emphasises the relations between human persons with respect to nonhuman things. However, as this article has shown, relations of ownership can

comprise relations among humans, between humans and landscape and between humans and other-than-human beings. *Apus* are seen as the guardians of land and water in the Andes and give fertility and wealth to those who live in their lands and reciprocate with *pagos* and *t'inkas*. Water is also a life-giving and living mother who must be nurtured if she is to reciprocate with vitality and fertility. Hence, there is a need to destabilise notions of ownership and rethink water ownership in terms of nurture, control and conditionality. In the Colca highlands dynamic and conditional forms of ownership emerge from collective investments of labour and practices of nurture and reciprocity in relationships between humans and other-than-human beings. Formalisation and enclosure, by contrast, sever these relations. This article suggests that, for a better understanding between state officials and farmers in the Andes, there should be no assumptions with regard to property in water or to the consequences that the formalisation of user rights might entail. Rather, different notions of ownership, and the ontological dynamics that produce them, should be taken into consideration when negotiating rights, access and payments.

### ACKNOWLEDGEMENTS

I am grateful to the special issue editors Karsten Paerregaard and Astrid O. Andersen for all their valuable comments, and I also thank Susann Ullberg, Malene Brandshaug and Abbey Lindsay for their constructive comments on an early draft of this article. I presented a short version of this paper at the NOLAN conference in October 2018, and I am thankful for the inspiring comments and questions I received from Marc Brightman, Cecilie Ødegaard, Juan Javier Rivera Andía, Stine Krøijer and María Guzman-Gallegos.

### REFERENCES

- Alba, R.; Bolding, A. and Ducrot, R. 2016. The politics of water payments and stakeholder participation in the Limpopo River Basin, Mozambique. *Water Alternatives* 9(3): 569-587.
- Allen, C.J. 1988. *The hold life has. Coca and cultural identity in an Andean community*. Washington, DC: Smithsonian Institution Press.
- ANA (Autoridad Nacional del Agua). 2010. *Ley de recursos hídricos y su reglamento. Ley No 29338*. Lima: Ministerio de Agricultura.
- Anand, N. 2017. *Hydraulic city. Water and the infrastructure of citizenship in Mumbai*. Durham: Duke University Press.
- Andersen A.O. 2014. 'Water is life'. An ethnography of urban ecology and water politics in Arequipa, Peru. PhD thesis, Faculty of Social Sciences, University of Copenhagen.
- Arneil, B. 1996. *John Locke and America: The defence of English colonialism*. Clarendon: Oxford University Press.
- Bakker, K. 2010. *Privatizing water: Governance failure and the world's urban water crisis*. Ithaca, N.Y.: Cornell University Press.
- Blaser, M. and de la Cadena, M. 2017. The uncommons: An introduction. *Anthropologica* 59(2): 185-193.
- Blomley, N. 2013. Performing property: Making the world. *Canadian Journal of Law and Jurisprudence* 26(1): 23-48.
- Boelens, R. 2015. *Water, power and identity. The cultural politics of water in the Andes*. London: Routledge.
- Bonelli C.; Roca-Servat, D. and Bueno de Mesquita, M. 2016. The many natures of water in Latin-American neo-extractivist conflicts. *Alternautas* 3(2): 81-92.
- Brightman, M.; Fausto, C. and Grotti, V. 2016. Introduction. Altering ownership in Amazonia. In Brightman, M.; Fausto, C. and Grotti, V. (Eds), *Ownership and nurture. Studies in Native Amazonian property relations*, pp. 1-35. New York: Berghahn Books.
- Budds, J. and Hinojosa, L. 2012. Restructuring and rescaling water governance in mining contexts: The co-production of waterscapes in Peru. *Water Alternatives* 5(1): 119-137.
- Busse, M. and Strang, V. 2011. Introduction. In Strang, V. and Busse, M. (Eds), *Ownership and appropriation*, pp. 1-19. Oxford: Berg.

- Damonte, G.; Gonzales, I. and Lahud, J. 2016. La construcción del poder hídrico: Agroexportadores y escasez de agua subterránea en el valle de Ica y las pampas de Villacurí. *Antropológica* XXXIV(37): 87-114.
- Damonte, G. and Boelens, R. 2019. Hydrosocial territories, agro-export and water scarcity: Capitalist territorial transformations and water governance in Peru's coastal valleys. *Water International* 44(2): 206-223.
- de la Cadena, M. 2015. *Earth-beings. Ecologies of practice across Andean worlds*. Durham, NC: Duke University Press.
- del Castillo, L. 1994. Lo bueno, lo malo y lo feo de la legislación de aguas, *Debate Agrario* 18: 1-20.
- del Castillo, L. 2011. Ley de recursos hídricos: Necesaria pero no suficiente. *Debate Agrario* 45: 91-118.
- De Soto, H. 2000. *The mystery of capital: Why capitalism triumphs in the West and fails everywhere else*. New York: Basic Books.
- Franco, J.; Mehta, L. and Veldwisch, G.J. 2013. The global politics of water grabbing, *Third World Quarterly* 34(9): 1651-1675.
- Gelles, P.H. 2000. *Water and power in highland Peru: The cultural politics of irrigation and development*. New Brunswick, NJ: Rutgers University Press.
- Gose, P. 1994. *Deathly waters and hungry mountains: Agrarian ritual and class formation in an Andean town*. Toronto: University of Toronto Press.
- Guillet, D. 1992. *Covering ground. Communal water management and the state in the Peruvian Andes*. Ann Arbor: University of Michigan Press.
- Guillet, D. and Mitchell, W.P. (Eds). 1994. *Irrigation at high altitudes: The social organization of water control systems in the Andes*. Washington: Society for Latin American Anthropology Publication Series.
- Hann, C. 1998. Introduction: The embeddedness of property. In Hann, C.M. (Ed), *Property relations: Renewing the anthropological tradition*, pp. 1-47. Cambridge: Cambridge University Press.
- Klarén, P.F. 2000. *Peru: Society and nationhood in the Andes*. New York: Oxford University Press.
- Linton, J. 2010. *What is water? The history of a modern abstraction*. Vancouver: UBC Press.
- Locke, J. 2002. *The second treatise of government, and A letter concerning toleration*. Mineola, N.Y.: Dover Publications.
- Macfarlane, A. 1998. The mystery of property: Inheritance and industrialization in England and Japan. In Hann, C.M. (Ed), *Property relations: Renewing the anthropological tradition*, pp. 104-123. Cambridge: Cambridge University Press.
- Mayer, E. 2002. *The articulated peasant: Household economies in the Andes*. Boulder, Colo.: Westview.
- Mehta, L.; Weldwisch, G.J. and Franco, J. 2012. Introduction to the special issue: Water grabbing? Focus on the (re)appropriation of finite water resources. *Water Alternatives* 5(2): 193-207.
- Oré, M.T. and Rap, E. 2009. Políticas neoliberales de agua en el Perú. Antecedentes y entretelones de la ley de recursos hídricos. *Debates en Sociología* 34: 32-66.
- Oré, M.T.; del Castillo, L.; van Orsel, S. and Vos, J. 2009. *El Agua, ante nuevos desafíos: Actores e iniciativas en Ecuador, Perú y Bolivia*. Lima: Instituto de Estudios Peruanos.
- Paerregaard, K. 1994. Why fight over water? Power, conflict and irrigation in an Andean village. In Guillet, D. and Mitchell, W. (Eds), *Irrigation at high altitudes. The social organization of water control systems in the Andes*, pp. 189-202. Washington: Society for Latin American Anthropology.
- Paerregaard, K. 2013. Governing water in the Andean community of Cabanaconde, Peru. From resistance to opposition and to cooperation (and back again?). *Mountain Research and Development* 33(3): 207-214.
- Paerregaard, K.; Stensrud, A.B. and Andersen, A.O. 2016. Water citizenship: Negotiating water rights and contesting water culture in the Peruvian Andes. *Latin American Research Review* 51(1): 198-217.
- Rasmussen, M.B. 2015. *Andean waterways: Resource politics in highland Peru*. Seattle: University of Washington Press.
- Scott, J.C. 1998. *Seeing like a state: How certain schemes to improve the human condition have failed*. New Haven, CT: Yale University Press.

- Seemann, M. and Boelens, R. 2014. Forced engagements: Water security and local rights formalization in Yanque, Colca Valley, Peru. *Human Organization* 73(1): 1-12.
- Seemann, M. 2016. *Water security, justice and the politics of water rights in Peru and Bolivia*. London: Palgrave Macmillan.
- Stensrud, A.B. 2016a. Climate change, water practices and relational worlds in the Andes. *Ethnos: Journal of Anthropology* 81(1): 75-98.
- Stensrud, A.B. 2016b. 'It seems like a lie': The everyday politics of world-making in contemporary Peru. In Bendixsen, S. and Bertelsen, B.E. (Eds), *Critical anthropological engagements in human alterity and difference*, pp. 253-272. Cham: Palgrave Macmillan.
- Stensrud, A.B. 2016c. Harvesting water for the future: Reciprocity and environmental justice in the politics of climate change in Peru. *Latin American Perspectives* 43(4): 56-72.
- Stensrud, A.B. 2016d. Dreams of growth and fear of water crisis: The ambivalence of 'progress' in the Majes-Siguas irrigation project, Peru. *History and Anthropology Journal* 27(5): 569-584.
- Stensrud, A.B. 2019a. Safe milk and risky quinoa: The lottery and precarity of farming in Peru. *FOCAAL Journal of Global and Historical Anthropology* 83: 72-84.
- Stensrud, A.B. 2019b. Water as resource and being: Water extractivism and life projects in Peru. In Ødegaard, C.V. and Rivera Andía, J.J. (Eds), *Indigenous life-making projects and politics of extractivism in South America: Ethnographic approaches*, pp. 143-164. Cham: Palgrave Macmillan.
- Strang, V. 2016. Infrastructural relations: Water, political power and the rise of a new 'despotic regime'. *Water Alternatives* 9(2): 292-318.
- Swyngedouw, E. 2015. *Liquid power. Contested hydro-modernities in twentieth century Spain*. London: The MIT Press.
- Valderrama, R. and Escalante, C. 1988. *Del tata mallku a la mama pacha: Riego, sociedad y ritos en los andes peruanos*. Lima: DESCO.
- van Koppen, B.; van der Zaag, P.; Manzungu, E. and Tapela, B. 2014. Roman water law in rural Africa: The unfinished business of colonial dispossession. *Water International* 39(1): 49-62.
- Vera, J.R.D. 2011. The ethno-politics of water security: Contestations of ethnicity and gender in strategies to control water in the Andes of Peru. PhD thesis, Wageningen University, The Netherlands.
- Verdery, K. 1998. Property and power in Transylvania's decollectivization. In Hann, C.M. (Ed), *Property relations: Renewing the anthropological tradition*, pp. 160-180. Cambridge: Cambridge University Press.
- Verdery, K. 2003. *The vanishing hectare: Property and value in postsocialist Transylvania*. Ithaca, N.Y.: Cornell University Press.

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