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COLLECTIVE ACTION, COMMUNITY AND THE PEASANT ECONOMY IN ANDEAN HIGHLAND WATER CONTROL

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Introduction

For many Andean communities, irrigation systems form the basis for accessing water for agricultural production and, as such, they are an important axis around which collective action is mobilized (Bolin, 1990; Hoogesteger, 2013b; Verzijl and Guerrero Quispe, 2013). In the Andean context, with unpredictable climates, unstable geophysical conditions, and changing irrigation policies, more than almost any other economic activity, irrigation is grounded in collective action that is based on *mutual dependence and intensive cooperation* among users. In the Andes, besides privately managed irrigation systems owned by landlords and agribusiness companies, two forms of irrigation development and water use systems prevail, which in broad terms can be divided into state led and community based. State-led irrigation development has been characterized by its large scale, high cost, market-oriented and top-down management approach since at least the 1960s. On the other hand, community-managed irrigation systems tend to be small scale, constructed with local resources and know-how, managed through collective action from the bottom up and often with a very diverse production rationale. These two forms of irrigation management have grown closer to each other in the last three decades as on the one side collective action has come to play a more important role in formerly state-managed irrigation systems and, on the other, the state has become more active in funding the modernization of community-managed irrigation systems.

In the 1990s in Peru and Ecuador irrigation management tasks were turned over to newly created Water Users' Associations (WUAs) in most formerly state-managed irrigation systems. This reduced state financing of irrigation operation and maintenance, often in an irresponsible manner (neoliberal 'dumping of irrigation systems'; see Cremers et al., 2005). It made many WUAs struggle for the survival of their systems, and at the same time they became reliant on different forms of collective action.

Many of these modes of inter-community collaboration had to be developed anew or transformed from other spheres of social life in and around the WUAs.

To better understand how and why user-controlled irrigation management has been able to sustain irrigation systems (even large and technically complex systems such as formerly state-managed systems) based on the mobilization of collective action, we first explore the close interrelationships that exist between peasant livelihood strategies, the recreation of community, and irrigation management. After this we explore how irrigation management is part and parcel of Andean peasant economies. Then we discuss how policies that are built on market mechanisms to sustain WUAs have a very different meaning once they land in local Andean irrigation systems. In the conclusion we argue that by better understanding the close relationships between community, peasant economy, and irrigation management, we can also better understand how and why collective action is so central in Andean user-based irrigation management, despite efforts to introduce market mechanisms in this sector.

User-based irrigation management and community in the Andes

Being a fundamental pillar of many local communities' livelihood systems, control over their own waters and related governance systems are of utmost importance for sustaining collective action. Yet, in face of the legal norms of state-based governance systems, it is a constant challenge to sustain and defend their autonomy and place-specific organizational forms. Unlike government-managed irrigation, where (formally) state authorities establish and enforce rules and specialized managers and technicians (often at various levels) carry out most management tasks, in farmer-managed systems the roles of water authority, water manager, and water user are integrated. As indicated by an Ecuadorian farmer and water manager of the Chambo–Guano irrigation system: 'the state agency used to have over 40 water guards responsible for delivering water to us, ... now that we are managing the system we only have three water guards, the remainder of the work [irrigation tasks] we do ourselves, through our own organization' (personal communication, 2013).

Members, as co-owners of the system, commonly co-decide about its management. Self-mobilization and direct action on the basis of social control, collective monitoring, and collectively elected, rotating leadership characterize the ability of all members to be involved in water control affairs. This is usually regulated by the existing water rights frameworks. Yet, aside from rights and duties, a series of operational rules is also necessary, with an organization that will take charge of implementing and enforcing the norms (see Uphoff, 1986). These norms usually establish the following tasks (Boelens, 2015; Boelens and Hoogendam 2002):

- Regulation and authorization: discussion, formulation, dissemination, and acceptance of constitutional rules, such as water rights, including procedures, obligations and penalties.

- Operational water management: e.g. implementation of water rights and regulations, through activities such as scheduling, distribution, and surveillance of water shifts; operation of hydraulic works; and oversight of infrastructure maintenance.
- Internal organization: e.g. definition of objectives, collective decision-making, activities coordination and planning, monitoring of implementation, conflict resolution, and ensuring members' participation.
- (Re)constructing infrastructure: design, construction, repair, and modification of hydraulic works and the irrigation network.
- Mobilizing and administering both members' and external resources: e.g. financial means, material resources, agricultural products, labor, and information.
- Alliance-building and networking: to elicit technical assistance; to represent the collective system and its individual users; and to defend users' collective interests.
- Ritual tasks, according to the system's embeddedness in the metaphysical domain: activities related to maintaining and reproducing reciprocal relationships with deities.

Despite heterogeneity, in most of these systems water users and water authorities are often one and the same as roles and responsibilities circulate among the group of users. Therefore they share a similar social and cultural background.¹ Organization, aside from being a (political-strategic) *end*, constitutes a *process* and a *means* for water users' collectives to sustain their autonomy and effective governance in water use systems. In Ecuador in the 1990s, after being confronted with a reckless neoliberal state-withdrawal project, water users in many formerly state-managed irrigation systems stood up for their rights to negotiate the conditions for taking over irrigation management tasks from state agencies (Hoogesteger, 2013a). This resulted in user organizations bending the Ecuadorian irrigation management transfer program, through which 35 out of 73 agency-managed irrigation systems were transferred to newly created WUAs (Cremers et al., 2005). Additionally, although not 'formally' transferred, inside many systems that remained 'agency-managed WUAs' water users' communities developed forms of co-management with the state agencies (which maintained control over the main canals).

In all of these transferred systems the WUAs were constituted (as established by law) as water-centered organizations that operate apart from the community organizations (see Verzijl and Dominguez, 2015 for a case in Peru). Nonetheless, informality and flexibility of organizational patterns often make the boundaries between the lowest organizational units of the WUA and community organizations blurry and vague. The root cause is the dynamic embeddedness of irrigation management in community life and livelihoods (see Boelens, 2015).

In systems that have had to conform to national law to get subsidies and/or because these were formerly state managed, there are special organizations, roles, and procedures for irrigation matters, whereas in others, usually small systems that

have had little state interference, irrigation matters are included as one element among other community issues. For instance, in Guanguilquí–Porotog in Canguahua (northern Ecuadorian highlands) communities have established a Community Assembly (where users and non-users jointly decide on community issues) as the lowest management unit of an irrigation system that brings together tens of communities and some large landlords who, at higher inter-community and multi-actor levels, come together in an overarching WUA (Hoogesteger, 2013b).

In most Andean (inter-)community systems, even in cases where at the lowest organizational level there is separation between water-related and non-water-related institutions, in practice this division is often permeable, with close interrelationships between the two. For example, in the community of Tomepampa (Cotahuasi, Peru) two types of collective work have been established: community work (to which everyone must contribute equally) and work of the Irrigators Committee (in which water users contribute labor according to their irrigated land area); but when it comes to cleaning the bullring and the streets or repairing the school, every water user has to be present. If not, they have to contribute more labor during the next collective work session of the Irrigation Committee (Panzani, 2003). In the Gompue system (Chimborazo, Ecuador) a family disobeying the collective decision-making of the General Assembly in whatever field of community interaction may face direct consequences and penalties in the irrigation sphere (Boelens and Doornbos, 2001). Making irrigation governance part and parcel of the overall community discussions and arrangements tends to strengthen communal bonds and interactions. The division between community and Irrigation Committee meetings and arrangements is often seen as problematic, as expressed by a user in the Pillaro irrigation system (Tungurahua, Ecuador):

I think it would be better if the community organization and the water organization would be together. Now each one calls separately for assemblies. One for issues concerning water; the other for other issues. I think these should work together. We used to do all in the community organization ... and that kept us united. Now divisions have been created because of two different assemblies.

(Cited in Hoogesteger, 2015: 406)

Yet just as often there are various entities within a community that interrelate closely, and each community member commonly belongs to several of these entities simultaneously. This guarantees that there are always multiple and intense interactions between the irrigation and community spheres.

Because of the obligatory reciprocity required to operate and sustain the system, and because of the common ownership of the system in which the rights of each user are ‘created’, ‘recreated’, and ‘embedded’ (for an international overview, see Boelens and Vos, 2014), users identify with the system and relate to each other. This is at the heart of collective action in water control and, jointly with the historical struggle for water, collective defense of community authority, and

development of the community's own rules and customs, it reinforces these context-specific hydraulic identities (see Boelens 2014, 2015). Because of this 'community embeddedness' of water tasks, informality, and institutional flexibility, aside from structural elements, an organization requires a series of cognitive elements, which are the ideas and beliefs about the need to cooperate mutually and follow the organization's rules (Boelens and Hoogendam, 2002; see also Chambers, 1980; Coward and Levine, 1987; Uphoff, 2000).

The lack of such community and supra-community cohesion that enables water users to mobilize collective action and (supra-)community resources flexibly for the operation and maintenance of irrigation systems lays at the heart of the state agencies' failure to manage Andean irrigation systems satisfactorily 'from the outside'. This became painfully clear from the 1980s onwards when state expenditure in the sector was severely curtailed in both Peru and Ecuador (Boelens et al., 2015; Hoogesteger and Verzijl, 2015). This fact is commonly neglected by technocratic water development projects that advocate for market mechanisms or just 'functionalist' irrigation organizations and rules as the key to successful irrigation management (Boelens and Seemann, 2014; Zeitoun et al., 2016). What these interventions fail to acknowledge is that in the eyes of local water users' collectives, irrigation management is an intrinsic part of community activities and as such intermingles with other spheres of community life, such as the construction and maintenance of the soccer field, the church, the main road, the school, other collective facilities, and cultural festivities. Irrigation is not only anchored in these wider activities that maintain the collective of the community but also deeply ingrained in the peasant economy, as we explore further below.

The peasant economy and irrigation management

In contrast to agency management or market-driven governance, which for communities comes from the 'outside', as explored above, in user-managed systems irrigation governance comes from 'within' the community and the collective. In turn, the collective, the community, and irrigation management are further embedded in the economic unit of the peasant family and thus the peasant economy (see Bebbington et al., 2010; Golte and de la Cadena, 1983; Mayer, 2002; van der Ploeg, 2008; Zoomers, 2010). Though, with its own logic and through different mechanisms, life in the rural Andes is inserted in the global economy through webs of exchange. For instance, the relatively constant and secure price of dairy in the international market (as well as locally) has triggered many peasant families in Ecuador to opt for producing fodder crops and dairy cattle on their irrigated plots (Hoogesteger and Solis, 2009). Likewise, the decision to produce onions, potatoes, tomatoes, flowers, or other cash crops is always directly related to the market prices that may be achieved for these products. In turn, these decisions determine how often, when, and how much irrigation water is available and will be needed (see Mena-Vásquez et al., 2016).

The Andean peasant economy is neither autarchic nor self-sufficient, but interwoven in the commoditized/mercantile and community/non-mercantile spheres of

production, reproduction, and consumption. Therefore, peasant families commonly spend part of their resources and time in the production of market-oriented products (milk, flowers, onions, strawberries, broccoli, fruits) and another part on products for self-consumption (home garden, milk, corn, potatoes, fruits), with the two often interchangeable depending on market prices and family needs. This leads to great heterogeneity in the production strategies of the peasantry. As such, irrigation systems in the Ecuadorian and Peruvian Andes often have a great variety of crops and production systems, all of which have their own water requirements. This demands great flexibility and adaptive capacity from the irrigation system management. Yet, as peasant users are also the managers of the system, any essential changes in water scheduling are usually negotiated in community and, where possible, accommodated. For instance, in the Pisque system water delivery was accommodated to enable farmers to engage in the production of roses even though the community recognized that it would be unable to meet water demand if a large number of users switched to the production of roses (see Mena-Vásquez et al., 2016).

For many families, production on their irrigated plots is not about maximizing monetary income but rather about ensuring stability in the long run. In other words, peasants – and most of all peasant women – try to bring together the need for household and community *reproduction* with the *transformation* of those social relationships that threaten this reproduction. Reproduction and subsistence rhythms of households, communities, and their irrigation systems (and inter-community production systems) are directly intertwined; and labor relationships, kinship ties, social favors, friendship relations, and community obligations (manifested in the exchange of goods, ceremonies, gifts, and so on) perform an important role in and give meaning to complex reproduction networks. For instance, in the Guanguilquí–Porotog irrigation system some communities' vegetable production is coordinated with the needs of local schools, which offer locally grown produce to the children at mealtimes. Likewise, throughout Andean Ecuador and Peru, families contribute their produce and labor to ensure there is enough food for everyone during community ceremonies and parties.

In this respect, peasants see their household as a production unit that is strongly related (but certainly not equal) to their home and consumption unit. This means that resources and production have not only an exchange value but also a very important use value. In times of crisis (low prices, low rewards for labor), the peasant family increases its labor efforts instead of decreasing them. Peasants also try to find a balance between production for self-consumption and for the market. Therefore, most households produce a large variety of products that combine animal husbandry (sheep, cows, guinea pigs, rabbits, poultry) and fodder, cereal, vegetable, and fruit production according to what the climatological and soil conditions allow. The frequently made distinction between 'domestic' and 'productive activities' generally blurs (as does that between 'female domains' and 'male domains'), since they combine and overlap, making the boundaries very fluid or even non-existent. Most of the activities that are labeled 'productive' are equally reproductive and domestic.

With respect to income generation or the allocation of family time and work, the role of agriculture is not even always primordial. Peasants seek employment in a variety of productive activities since it is impossible to guarantee survival within subsistence agriculture when engaging in only a few activities of marginal output. Diversification is sought both within farming itself (e.g. agriculture, animal husbandry, forestry, market and domestic consumption, irrigated and non-irrigated crops, crops in several ecological altitudinal zones, associated crops, paid labor in the hacienda's irrigation system and non-paid labor in the community's system) and in non-farming activities (marketing, handicrafts, temporary migration, and so on). Furthermore, diversification relates to space and time: household activities are not necessarily carried out in the same space (this is, the peasant holding), nor at the same time (because of the strategic distribution over the course of the agricultural season and its migration periods). For instance, in Ecuador and Peru seasonal out-migration of workers from the Andes to the coast (for work in the agro-export industry), the Amazon region's oil industry, or the larger cities is common.

In Andean communities and irrigation systems, families apply several reciprocal social relationships of labor exchange which provide the workforce and other scarce resources needed for production and reproduction at both family and group levels, without having to buy them in the market. Each one of these relationships, such as the *ayni*, the *maquimañachi*, the *minga*, the *faena*, and *trabajar en compañía* ('work together'), has different aspects and names throughout the Ecuadorian and Peruvian highlands. But they are all relationships that, to a certain point, can counter social differentiation and, above all, make available the necessary resources to the less well-off, without denying the fact that this reciprocity is sometimes asymmetric (something that is especially evident in irrigation systems). Therefore, labor relationships play an important role in structuring informal organizations, networks, and practices in communities and irrigation systems. Thus, defining water rights, and establishing the best means to realize them, is central to shaping 'collective contractual reciprocity' (Boelens, 2015) in Andean user communities.

Integrating market mechanisms and collective action in irrigation management

In spite of capitalist market penetration in Andean rural communities, non-mercantile sphere exchanges and interactions have resisted – and will resist in the future – substitution by purely commoditized relationships. A principal reason for this is that neither peasant families and communities nor their irrigation systems will be able to reproduce themselves within exclusively mercantile relationships, and they are well aware of this fact. The consciousness that 'community', 'reciprocity', and 'collective action' form a central axis for the adequate defense and effective use of the community's productive resources, both collective and individual, has kept certain market spheres at bay (Boelens et al., 2014). Generally, peasant households perceive that non-commodity relationships ensure long-term reproduction and

offer a protective framework against the vicious circle of poverty, debt, and exploitation.²

In the irrigation domain, alongside the transference of irrigation responsibilities to WUAs in the 1990s, great effort was put into the introduction of market mechanisms to ensure the financial sustainability of those WUAs (Hoogesteger, 2015). The World Bank-financed Irrigation Management Transfer programs set full-cost recovery and financial solvency of WUAs as important pillars that would guarantee the sustainability of the irrigation systems' operation and maintenance (World Bank, 2001; Hendriks et al., 2003). In Ecuador and Peru many of the newly created WUAs were equipped with, for that time, sophisticated administrative systems, and irrigation fees were established to cover all expected administration, operating, and maintenance costs (Vos, 2002). Nonetheless, in most irrigation systems water fees were never fully collected and many assemblies and directive boards of the new WUAs quickly lowered the fees to the bare minimum. For instance, in the Chambo–Guano irrigation system in Chimborazo, which covers around 5,700 hectares and over 10,000 water users, the annual budget of the WUA was \$10,000 in 2011. This was barely enough to cover the salaries of the administrative staff and the water guards, and the guards' field transport expenses. Yet, when needed, the WUA has an enormous capacity to mobilize its eighty-two constituent water assemblies and their members for collective action aimed at ensuring the sustainability of the irrigation system (see Hoogesteger and Verzijl, 2015). Also within the constituent assemblies collective action forms the basis for ensuring water delivery.

One of the main problems identified by many community members of irrigation systems who have witnessed external interventions to 'improve' irrigation management is that, in their efforts to promote and ensure 'rational' financial sustainability, both the communities and their forms of collective action (community relations) have been replaced with market-based relations in which paying the irrigation fee – rather than participating in community affairs – becomes central. This creates conflicts with community reciprocity notions in which collective action and 'functional solidarity' are central. In these relations monetary contributions are neither fixed nor periodic, but usually established by the General Assembly to cover specific and well-identified costs. Therefore, tensions arise. As one community leader from the Pillaro irrigation system in Tungurahua, Ecuador, put it: 'In the last years we have had several conflicts ... the Water Assemblies have separated themselves from the community structures ... and the new directives have applied a lot of monetary sanctions and that creates conflicts' (personal interview with Jaime Hoogesteger, February 2008). For the same reason, positions in the directive boards of the WUAs and water committees of communities are voluntary functions. Having little to no budget also works as a mechanism to get people to participate on the boards not because of economic self-interest but because of conviction and commitment. And although there have certainly been cases of power misuse, mismanagement, and personal financial gain in WUAs, the financial losses associated with such activities are often low.

Rather than leaning on irrigation fees, market mechanisms, and outside commercial 'technical know-how', most communities and WUAs rely on local knowledge, labor, and collective action to sustain their irrigation systems. Maintenance and rehabilitation of the irrigation system are done where possible through collective work. Even when external technical support is sought to solve more complicated infrastructural problems, the unskilled labor is usually provided through community-based (and unpaid) collective work teams.

This does not mean that all operating and maintenance tasks can be performed with local skills, labor, and resources alone. Large-scale maintenance is often required in most of the Andes' irrigation schemes as there is a constant threat of landslides that have the potential to wipe away whole chunks of infrastructure in the steep and often rather unstable terrain. However, to repair such damage, most WUAs have developed a two-pronged strategy that relies, first, on collective work and the incidental collection of targeted maintenance fees; and, second, on the mobilization of their networks to secure external funding for essential repairs. For instance, the Guanguilquí irrigation system garnered support from the municipality of Cayambe to pay for the reconstruction of its main canal; in Chimborazo, the Licto irrigation system received support from the provincial government to replace a large siphon that had reached the end of its usable life; the Chambo–Guano irrigation system received support from the National Irrigation Institute to line its main canal; and several smaller systems have elicited support from non-governmental organizations and the National Irrigation Institute to line their systems, install sprinkler irrigation, and construct night storage reservoirs.

As such, market mechanisms that aim to guarantee a financially healthy WUA may be seen in a very different light. For local users, it is not fees and money that make their system work; it is the people and the collective that stand at the core of an efficient irrigation system. And although at some points in time fees and monetary contributions can form an important aspect of the collective efforts that are needed to sustain irrigation, these are usually kept to a minimum. Moreover, financial and labor contributions are often exchangeable on the basis of users' ability to contribute one or the other. For instance, in the Pillaro irrigation system (Tungurahua, Ecuador), and other systems, farmers can buy themselves out of some of their collective work responsibilities when they are unable to fulfill them because of temporal migration or other reasons. Similarly, widows, pregnant women, and single mothers are often excused hard physical work, and alternative contributions are often devised for those who cannot afford to pay the standard WUA fees. This brings us back to the fact that irrigation management, along with the maintenance of the peasant economy and the recreation of community, is organized by the users with flexibility, creativity, and collective force and intelligence rather than hard money, tight rules, fixed fees, strict adherence to financial guidelines, and external 'expert' knowledge.

Conclusions

In this chapter we have analyzed the relations between community, peasant economies, and irrigation management based on examples of irrigation systems in

Ecuador and Peru and have shown that collective action is intrinsically related to and glues together these three spheres. The close interrelations among the three spheres makes them mutually dependent and in many cases robust. Therefore, irrigation management cannot be seen as separate from the other spheres of rural life, as is often done in projects and interventions in the irrigation domain. This provides evidence of a very different rationale for the management of irrigation systems than the ones that are advanced by, for instance, the World Bank and many national governments – which range from public–private partnership projects to top-down laws or market-based water rights frameworks. The irrigation management transfer programs in Ecuador and Peru were very much concerned with narrow-mindedly establishing WUAs as financially autonomous and healthy institutions that would guarantee cost recovery for the operation, administration, and maintenance tasks of formerly state-managed irrigation systems (Hendriks et al., 2003; Vos, 2002). Nevertheless, many of the installed WUAs now operate under a very different rationale that rests heavily on and is engrained in the logic of collective action and working on the irrigation system from within.

The fact that current irrigation development often means ‘more market’ is not necessarily problematic. It is not a question of either embracing or rejecting this market. As stated above, in contemporary Andean society, peasants also *require* aspects of the mercantile sphere to be able to obtain the resources that are needed for reproduction. Therefore, strategic questions relate to:

- strengthening *endogenous control* over decision-making on the issues of why, where, how, and when to relate to the market;
- ensuring access to markets in a collective, equitable, organized manner; and
- finding the required balance in the interaction between commodity and non-commodity spheres, considering that the latter underlies reproduction of both the collectivity and its parts, and access to the market without losing the capacity for self-management (see Boelens et al., 2014).

This reality calls for a rethinking of water governance notions that rely heavily on markets or government interventions and draws attention to the importance of devising strategies that strengthen the ties on which Andean irrigation systems have survived for centuries, albeit at new scales and within the present-day context.

Notes

- 1 This does not necessarily mean that these water users/leaders have the same class or ethnic background, or gender. Such differences may be obstacles to strong user organizations, but it is also crucial to recognize the *organizing potential of heterogeneity*. Heterogeneity can reinforce the forms of cooperation based on interdependence and complementation of capacities and resources.
- 2 For example, in times of economic crisis, it is common for many communities to retreat partially and strategically from the market and return to non-monetary exchanges as a defense

against both market exploitation and hyper-devaluation and insecurity of monetary means. Mayer (2002), for instance, refers to the 1994 study of Javier Escobal, which shows that, after Peru's appalling Structural Adjustment Program in the 1990s, the least monetized peasants were relatively far better off than farmers who fully integrated into the market system.

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