Julie McClatchie
300078908

Major research paper
An alternative to economic efficiency:
The case of water management in peri-urban Ecuador

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Abstract

This major research paper considers social efficiency as an alternative to the dominant economic efficiency paradigm in resource management. By looking at the Ecuadorian water domain to support this shift in academic thinking and policymaking, this research paper focuses on ways in which Indigenous involvement in water service management influences the efficiency of water services in peri-urban zones. It is argued that by using a communitarian approach to resource management, Indigenous actors prioritize social welfare goals and ends of water management rather than narrowly conceived 'economic' ones, and through their capacity to establish and scale up water networks to voice their interests at broader levels. To demonstrate such an argument in more detail, this work looks at the province of Chimborazo as a space of divergence in search of alternatives.

Acknowledgment

As per Indigenous tradition, this major research paper is the result of a plurality of knowledge sources. For the scientific or academic knowledge, I would like to thank my supervisor Dr. Susan Spronk for her time, constant devotion and immense knowledge reservoir. Some would characterize her as a radical thinker, I would simply say humane. In terms of knowledge of the heart, I would like to mention the unconditional support of my parents. My mother, for teaching me to be resourceful and patient, and my father for teaching me to be driven and to always push the limits of cognizance. Both for allowing me to have an open mind about the diversity of our world, because one should never stop to wonder.

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Acronyms

CESA	Ecuadorian Agricultural Service Agency
CODERECH	Corporacion de Desarrollo Regional de Chimborazo
CODOCAL	Indigenous Corporation of Peasant Organizations of Licto
CONAIE	Confederación de Nacionalidades Indígenas del Ecuador
CNRH	Consejo Nacional de Recursos Hídricos
INERHI	Ecuadorian Institute of Water Resources
RDC	Regional Development Corporations
SDC	Swiss Agency for Development and Cooperation
WALIR	Water Law and Indigenous Rights
WUA	Water User Association
WUO	Water User Organization

Introduction

In fairly recent years, water has been recognized as a critical resource. Topics of water supply, distribution, access and management have become key issues in the context of mounting environmental, social and political pressures due to climate change. Worldwide, inequality of access is especially stark in rural and peri-urban areas when compared to urban areas; 7 out of 10 people are endangered by a lack of access to water and proper sanitation in rural and peri-urban areas compared to 2 out of 10 in urban areas (WHO & UNICEF, 2012, p.23). The increasingly popular opposition to the construction of new mega-dam projects worldwide and struggles against water privatization have also brought water politics to the forefront of social and political agendas, both at domestic and international levels (Swyngedouw, 2004, p.8). In the context of climate change, the social risks related to the stresses created by inequitable access to water issues are ever more important.

While conventionally water issues in both rural and urban areas have been addressed through economic and engineering lenses, social and political dimensions of these issues have also gained salience. In a recent influential special report, the IPCC notes that we need "system change" not just more technocratic solutions (IPCC, 2018, p.95). Major shifts on that front have been observed in the Latin American region where the *socialismo del siglo XXI* has been questioning the foundations of the Western development model. With respect to research on water and sanitation, Ecuador is the poor cousin of Bolivia since fewer studies have been carried out on relations between the State and the Indigenous population. Considering the prominent Indigenous population in peri-urban Ecuador, this research investigates emerging alternatives embedded in Indigenous ideals of social economy and welfare in order to challenge mainstream notions of efficiency.

There is much to learn from communities in Ecuador where there is an active water justice movement that has successfully challenged dominant political structures and water order. Many critical scholars have upheld Ecuador's 2008 Constitution as the most progressive in the world, at least from an ecological perspective (see Boelens, Hoogesteger, Baud, 2013, p.282; Gudynas, 2011, p.442; Hoogesteger, 2012, p.78). Its principles represent the important political agency of the Indigenous-based movement of water users. These principles, based on the *Buen Vivir* model, include the improvement of the quality

of life, both material and spiritual; the establishment of a social economy; the restoration and conservation of nature, to ensure equitable land use; and finally, promote a plurinational and intercultural state (Gudynas, 2011, p.443). More importantly, the Constitution rejects the human-nature dichotomy engrained in imaginaries by the Western colonization of the mind (Gudynas, 2011, p.445).

One of the reasons that the Ecuadorian Constitution is so progressive is because of the power of the Indigenous movement. In the 1990s and 2000s, localized autonomous organizations of water users established and organized user-based federations as well as networks as a defense strategy to protect their interests (Hoogesteger, Boelens, & Baud, 2016, p.95). They attempt to bridge the gap between state interventions and local organizations' governance models, piecing together knowledges, structures and agencies to ultimately establish alternatives to water governance models. (Boelens, 2015, p.227). In the words of Spronk, Crespo and Olivera, "there are at least two factors that appear to explain the emergence of communal water systems in peri-urban areas: a weak/absent state, and indigenous/campesino knowledge about water systems that is transferred from rural to urban areas" (2012, p.439).

In Ecuador, the organization of water systems is better contextualized within the prominence of the Indigenous groups and the extent of their networks, thus intertwined with the proliferation of Indigenous knowledge of water system management. Yet, even though with the election of Rafael Correa in 2008, after which the State attempted to shift towards a socialist model, water privatization has not been outlawed by the new Constitution. Article 7 of the document allows for an exception creating for private sector participation in places where local authorities claim to have insufficient technical and financial resources. This is direct discrimination against rural and peri-urban zones where mobilization of such resources is often partial if not absent. Additionally, the 2014 reform of the 1972 Water Law remains beneficial for commercial users of water to the detriment of its domestic and agrarian users (*República del Ecuador, 2008. Constitución del Ecuador; Ley de aguas, Ecuador, Ley 369 de 1972*). Opposition has spread throughout the country against state exploitation of natural resources, including water, and the CONAIE, representing various local communities and regional associations, along with the rest of the

Indigenous movement, are fighting for the recognition of their collective rights, land and resource use and identities.

Research Question, Hypothesis and Structure

The denial and promise of Indigenous capacity for alternative modes of resource management is not only what fuels resistance, but also what motivates this research's inquiry. Indeed, this paper strives to shine more light on Indigenous agencies in water management. Thus, the main objectives of this work are therefore to further add to the comprehension of community-level efforts to improve water and sanitation access, as well as push forward an alternative understanding of the notion of 'efficiency' that undergirds dominant neoliberal policy frameworks. The guiding question for this research is: how does an increased participation of Indigenous populations in water service management affect the "efficiency" of water services in peri-urban Ecuador? Based on a preliminary collection of information of secondary literature, I propose the following hypothesis: following a localized rationale, Indigenous communities improve the social efficiency of water services which has a positive effect on related social welfare impacts. Their capacity to scale up water networks as a strategy for representation results in an alternative to both the conceptualization of water management and governance, and the efficiency paradigm as to disconnect it from its economic influences.

This MRP focuses on the experiences of peri-urban communities in the Chimborazo province as well as in the Ecuadorian highlands. These are good examples of such phenomena because of local impact of Indigenous participation in water management services and because of the strength of their provincial federation *Interjuntas-Chimborazo.* This research aims to add to the debate on alternatives to the dominant way that 'efficiency' is understood within the mainstream paradigm that governs resource management in Ecuador. As well, I aim to understand what social efficiency means to the actors themselves in the peri-urban areas of Ecuador. The MRP is organized as follows. First, I look at the historical context of Ecuadorian water governance, making explicit the link between the evolution of water control and Indigenous resistance. It will also demonstrate the need for a shift in the economic efficiency paradigm due to past failures. Secondly, I will explore the notion of social efficiency and the production of social capital by Indigenous and

peasant groups, considering that they mainly compose the water user organizations in peri-urban Ecuador. Thirdly, to consolidate and protect such production, this work looks at how water user communities engage in scalar politics to voice their interests and concerns at broader levels of governance. Finally, the Licto District and *Interjuntas Chimborazo* case study will be used to embody, link and concretely demonstrate the way in which Indigenous involvement in water services management influences social efficiency.

Methodology and Conceptual Framework

This research uses a qualitative case study methodology to examine why there is a need for an alternative to the economic efficiency paradigm in water management of rapidly developing peri-urban zones, as well as how Indigenous communities are better suited in context-embedded water management schemes to ensure social capital production and distribution of welfare benefits. A qualitative methodology is most appropriate for this research inquiry as it sets the ground for a thorough examination of the social and political processes and context that are supporting and framing the Ecuadorian phenomenon (Creswell, 2013, p.32). In recent times, case studies have become increasingly more accepted as a valid form of interpretive research (Yin, 2015, p.55; Flyvbjerg, 2006, p.232). This project uses a single case study approach within Ecuador and examines social actors engaged in the water domain at local, provincial and national levels. This case study was elaborated to demonstrate the multi-scalar nature of the water issue in Ecuador as flows transcend physical and political divides. This multilevel embeddedness also strives to highlight the political agency of actors at different levels thereby allowing an in-depth comprehension of "the processes, institutions and contextual realities that affect progress towards" equal access to water resources, retributive justice and decision-making environments in Ecuador (Babadjide, 2020, p.36).

The conceptual framework of this major research paper is based on the emergent literature on social efficiency (see Hoogesteger, 2013; Lefeber & Vietorisz, 2007; Spronk 2010), which offers a critical look at neoclassical theories of the market and economic efficiency and their failings to enhance social welfare in the Global South. These critical scholars also aim to broaden our horizons by establishing alternative criteria for defining and evaluating efficiency, which "are suitable for the pursuit of diverse goals, such as

equity, stabilization, and social and environmental sustainability" (Lefeber & Vietorisz, 2007, p.140). This perspective also ties with post-development theory and the search for broader alternatives to 'development,' as captured by the notion of *Buen Vivir* in Ecuador. I will also draw on the literature on political ecology and urban political ecology (see Boelens, 2015; Hoogesteger, Boelens, 2016; Perreault, 2003; Swyngedouw, 2004), which acknowledges the centrality of hydrosocial territories[1] and the centrality of hydrosocial identities and networks in the establishment of a different water governance model. Political ecology also advances a research agenda that aims to achieve environmental justice, foregrounding the importance of cultural recognition and political participation in achieving water justice in the Ecuadorian highlands, the latter being an essential component of social welfare and therefore social efficiency of water service management. Finally, the many contributions in McDonald & Ruiters' book *Alternatives to Privatization: Public Options for Essential Services in the Global South* will allow for a better understanding of the alternatives existing within the public sector systems of provision.

Ecuadorian Context of Water Governance in the Second Half of the 20th Century

In water management, concepts such as democratization, participation and empowerment have been central to international and national neoliberal discourses, initiatives and policies since the 1980s. In the Latin American region, this "democratization" endeavour was usually embedded in policy frameworks pushing for decentralization of the main governance bodies, a lesser involvement of the State in water management and market incentives and restrictions for self-regulation of water distribution (Hoogesteger, 2012, p.76). In many countries of the Andean region, this process led to externally-planned water reforms focused on the delegation of water system tasks and responsibilities to local levels of governance as well as to newly created local water user associations (WUAs). Yet, behind the curtain of most decentralization programs, various social actors' involvement was limited to the willingness of the state. While maintaining

[1] In this context, hydrosocial territory is defined as "the contested imaginary and socio-environmental materialization of a spatially bound multi-scalar network in which humans, water flows, ecological relations, hydraulic infrastructure, financial means, legal-administrative arrangements and cultural institutions and practices are interactively defined, aligned and mobilized through epistemological belief systems, political hierarchies and naturalizing discourses" (Boelens, Hoogesteger, Swyngedouw, Vos, & Wester, 2016, p. 2).

decision-making powers in the hands of the elites, this wave of policy models often portrayed values of transparency claims and democracy to hide their fundamental political character (Hoogesteger, 2012, p.76).

As a result, in Ecuador, the rise in formal participation was camouflage for the failure of most decentralization initiatives to create spaces for efficient water user participation in water management and governance, reducing even more marginalized groups' inputs such as those of Indigenous peoples. From this standpoint, the progressive nature of the new 2008 Constitution in Ecuador is not due to the embrace and application of post-development policies by the state such as proclaimed by the implementation of the *Sumak Kawsay* model for state development, but rather the power of the Indigenous movement in Ecuador to surpass their localized and marginalized conditions, enter the nationwide political arena and create a front for the social welfare of the Ecuadorian people.

Indigenous Politics

In most of the Andean region, irrigation water ties diverse Indigenous and peasant communities with altitudinal zones historically owned by the elites in the water domain, creating a vertical economy (Boelens, 2015, p.109). This territorial layout fosters socio-productive relationships as well as the formation of community organizations. In Ecuador, the scale of Indigenous politics has significantly been determined by state policies over land and resources, and modernization of the water domain (Perreault, 2003, p.101). Historical disparities in access to water sources and other developments such as urbanization, rapid demographic changes and the increasing presence of other water-use sectors have supported the ever-evolving threat to the status of Indigenous and *campesino* system (Cremers, Ooijevaar & Boelens, 2005, p.38). In this context, water became both a source of conflict and collaboration, one of marginalization and emancipation (Boelens, 2008, p.48).

The Indigenous movement came to light in the mid-1980s as CONAIE was consolidated as a nationwide platform reassembling various Indigenous groups advocating for the recognition of land, resource, identity rights and representation (Boelens, 2008, p.55). It set the tone and gave tools for multiple territorial, legal and cultural claims of recognition and autonomy of the Indigenous populations and overall marginalized groups

over the years. In its initial phase, between 1985 and 1995, the movement struggled to gain recognition and legitimacy from non-state actors, which they built over time with massive and recurrent mobilizations (Boelens, 2008, p.55). Indeed, the important sequence of uprisings in the 1990's and 2000's led to an increased political sophistication of various Indigenous groups regarding demands for political participation, land and ethnic identity (Clark & Becker, 2007, p.120). The CONAIE march in the capital city of Quito in 1990 has drawn national and international attention to the ongoing land disputes in the regions of the Amazon and the highlands (Clark & Becker, 2007, p.1). These mobilizations strived to "not only break the patterns of paternalism, discrimination, and exploitation that mark relations in Ecuador but also to restructure the state's political institutions so as to deepen Ecuadorian democracy" (Perreault, 2003, p.102).

The fairly recent power of the Indigenous movement within the Ecuadorian state has culminated with the fast development of provincial, regional and national Indigenous organizations such as *Interjuntas Chimborazo*. In the period following a gain of legitimacy in the civil society, between 1995 and 2003, the Indigenous movement decided to integrate the political system and penetrate institutional structures at different levels of governance (Boelens, 2008, p.55). The rise of the Pachakutik Plurinational Unity Movement as a leading political party in the government of more recent times is a reflection of this "struggle from within" (Walsh, 2010, p.18). Indigenous claims were defended through this spatial tactic of Indigenous populations in urban public spaces at a physical level and metaphorically bridging the rural, peri-urban and metropolitan zones. Their actions posed as a challenge to exclusionary power structures relying on control based on the reinforcement of scale hierarchies and territorial marginalization (Perreault, 2003, p.102). It also came as a challenge to the internal balance of the Indigenous movement, as concrete changes in relation to distributive justice were frustrated in practice, creating a divisive dynamic within, especially concerning water injustices (Boelens, 2008, p.56). Following the government of Lucio Gutiérrez in the early 2000s, multiple social movements performed a partial withdrawal from the "inside" (Walsh, 2010, p.16).

In the water sphere, however, it did not suggest that users and collectives became powerless. The consolidation of multi-scalar networks by local water users' alliances of Indigenous roots was an ongoing process, where social agents remained active in

administering infrastructure and water distribution, in networking and creating strategic alliances in order to defend similar interests. Indigenous groups in Ecuador have remained strongly involved in national politics both from within and outside of the political system. The resulting 2008 Constitution putting forward the Indigenous *Sumak Kawsay* cosmo-vision demonstrates the active political agency of marginalized water user groups. This, tied with networking strategies establishing links with other social movements, allowed the introduction of an alternative state development model and centralized the Indigenous movement in the national political arena (Walsh, 2010, p.18). Their political legitimacy and constant advocacy work brought back access to financial, political, social and natural resources to local communities.

Yet, the institutionalization of traditional communal traditions in regard to land and resources, as well as the recognition of a plurinational Ecuadorian state in theory were not materialized in practice. On the contrary, to this day, state involvement in water management has increased as water became a public good mainly administered by the government, returning the control to previous hegemons in the water domain and perpetrating hierarchical structures of power (Dupuits, & Bernal, 2015, p.25). Thus, the result of this institutional recognition of water rights and knowledges is the freezing of such collective rights by its codification in isolation from its cultural context. The consequences were similar with regard to the water laws of 1972 and 2014, where combined with the adjacent regulations, did not correspond to existing local management processes, any more than to the power to establish rules or organizations took local diversity into account (Clark, & Becker, 2007, p.78). Instead, very detailed and uniform prescriptions are stipulated, especially in the administration of public irrigation systems being governed by a single set of rigid regulations, a general version covering the management of irrigation systems all throughout the country (Ley de aguas, Ecuador, Ley 369 of 1972, art.5). The Licto-Gompuene case study will further demonstrate the consequences of such uniformity found in state intervention, and in parallel an example of the success at a smaller scale of Indigenous implication in water management when framed in the efficiency of social welfare.

Water Sector Reforms

At the turn of the 20th century and reaching its peak in the 1960s, several Latin American countries began on large-scale nation-building projects following the cathedral model and the concept of "the State of development" (Boelens, Hoogesteger, & Baud, 2015, p.283). In Ecuador, the initial post-colonial water law of 1883 acknowledging public and private ownership of water asking for registration of water users was then substituted by the 1936 law giving government a more important role in water management (Boelens, Hoogesteger, & Baud, 2015, p.283). Nevertheless, production and management of water resources continued to be largely under central, often private landlord or collective community operation, and from the 1960s forwards, water management in Ecuador was nationalized and centralized. Many national institutions were established for regulation, allocation and infrastructure construction. From this hierarchical structure of water control emerged the technocratic Ecuadorian Institute of Water Resources (INERHI) as a department of the Ministry of Agriculture, as well as the 1972 National Water Law which nationalized water property rights (*Ley de aguas, Ecuador, Ley 369 de 1972.*). These two tools forced the introduction of institutional and governmental rationality in local water management.

This logic was replicated in the 1980s and 1990s following the policy shift towards decentralization and privatization. Privatization resulted in the dismantlement of the collective property system previously established by Indigenous and peasant communities, this system seemingly abnormal to the modern tradition of water management. Through decentralization processes, governance of water irrigation was transferred to provincial and local levels of government that had little to no resources and bodies to properly administer those changes and the involvement of external actors mainly from the private sector became the norm in water management and irrigation initiatives (Hoogesteger, Boelens & Baud, 2016, p.95). The role that the Ecuadorian state chose to take was to promote economic development of the water domain by means of establishing legislative and regulatory mechanisms to be put into practice by a technocratic apparatus. This allowed for the economy of the country to modernize and be dictated by norms of production while preserving urban and rural water elites. Capitalist relations of production were integrated into the Ecuadorian social formation, where water fees, demands for land and such factors

instated the end of non-capitalist relations of production (Guerrero, 1975, p.33; Velasco, 1983, p.86).

Due to a regionalization process following an overall decentralization of the State's tasks, INERHI was then replaced by the independent *Consejo Nacional de Recursos Hídricos* (CNRH)[2] in 1994 (Cremers, Ooijevaar & Boelens, 2005, p.42). The latter has been working in concert with various regional development corporations (RDCs) to invest in the creation of new irrigation systems and the maintenance of state-owned infrastructure (Cremers, Ooijevaar & Boelens, 2005, p.42). The regional corporations had the responsibility to coordinate different levels of government in the implementation of development initiatives (Hoogesteger, Boelens & Baud, 2016, p.95). Over 10 Water Agencies were created throughout the country to manage water allocation, mediate conflicts and enforce legal water norms related to water use and rights. Simultaneously, according to the spatial boundaries dividing provinces, the RDCs answering to said agencies were in charge of multiple water management tasks related to state irrigation systems including maintenance, administration, operation, and management (Hoogesteger, 2012, p.78). These institutional changes were accompanied by severe cuts of state budgets related to water management and were met with fierce resistance from water users. This transition as well as the analysis of the water management practices by the Chicago boys leading to the neoliberal water legislations of the 1990s failed to address the important population shift from rural to urban areas which resulted in the development of peri-urban zones in Ecuador, such as the peri-urban zone of Licto District (Boelens, 2015, p.236).

In the midst of structural adjustment policies influenced by the World Bank, an irrigation management transfer program was proposed in 1995 to formally introduce state-managed irrigation systems tied together by WUAs which had tertiary and secondary level water management responsibilities (Hoogesteger, 2012, p.79). Being composed of local Indigenous and peasant groups, these newly introduced organizations gradually

[2] The CNRH is made up of 57 members, with 29 from the federal government, 10 from the state water resources councils, 12 resource users and six from civil water resources organizations. It is responsible for formulating the national water resources policy and establishing guidelines for its application; promoting the articulation of water resources planning with national, regional, state and user sector plans; approve the National Water Resources Plan; define the collection values for the use of water resources and, in conjunction with the river basin committees, the priorities for their execution; authorize the creation of water organisms and approve the framework of bodies of water in classes (Latinno. *Consejo Nacional de Recursos Hídricos*).

transformed into grassroot-based societal actors with greater legitimacy and autonomy in the local water management domain. They introduced a plurality of systems of knowledge in the water domain by using both state regulatory framework to water management and Indigenous communal traditions (Boelens and Doornbos, 2001, p. 348). To overcome the scalar constraints to the political agency of local organizations, non-governmental organizations (NGOs) and development organizations in the agricultural and water domains tried to put forward similar initiatives to create WUA federations both at provincial and national levels. The aim was to allow the emergence of spaces where various water-related stakeholders, from both the institutional and non-institutional ends of the spectrum, could deliberate over water policies and programs (Hoogesteger, 2012, p.79). These spaces should have logically led to practices and processes favoring the democratization of water governance. After erasing multiple fails in establishing provincial and national federations because of a lack of credibility due to inherent corruption in the governance structures at the time, one grassroots organization was able to emerge as the result of a coproduction process between WUAs in the province of Chimborazo and neighboring non-governmental organizations: the Provincial Federation of Water User Organizations *Interjuntas-Chimborazo* (Korovkin, 1997, p.32). It challenged the existing hierarchy structure in water governance "from below" because of the creation of a dense network of interrelated actors from the different sectors (Korovkin, 1997, p.32).

The impact of such alliances was immediately felt in Ecuadorian water politics as increasing opposition to water privatization was demonstrated by marginalized groups. The 2002 authorization to privatize water supplies in Quito motivated strong mobilization (Harris & Roa-García, 2013, p.23). It led to the administration of the 2003 analysis of institutional reform of Ecuador's irrigation sector, which was conducted by investigators from Water Law and Indigenous Rights (WALIR) (Cremers, Ooijevaar & Boelens, 2005, p.38). The inclusion of members of the Indigenous party linked the *Confederación de Nacionalidades Indígenas del Ecuador* (CONAIE)[3] into the newly elected government

[3] CONAIE is an organization bringing together nationalities, communities and Indigenous associations of Ecuador in the face of domination, discrimination and exploitation emerging during colonial times. The main objectives are to consolidate the indigenous peoples and nationalities of Ecuador, to fight for indigenous land and territories, to fight for their own education (intercultural bilingual), to fight against the oppression of the civil and ecclesial authorities, fight for the cultural identity of indigenous peoples, against colonialism and for the dignity of indigenous peoples and nationalities (CONAIE).

pushed forward an agenda recognizing the importance of a reform of techno and ethnocentric water policies and the importance of the overall water resource management framework (Cremers, Ooijevaar & Boelens, 2005, p.38). The necessity to put forward viable alternatives to the neoliberal model focused on economic efficiency and relations of production came from a common agreement on years of institutional failures in the irrigation sphere. The period before the introduction of the new constitution was characterized by the bureaucratic top-down nature of water management and decades of privatization initiatives, sparse public investments and a rocky transfer of operations to emerging water user organizations mainly composed of Indigenous and peasant populations who didn't have the necessary financial and human resources (Cremers, Ooijevaar & Boelens, 2005, p.38).

In short, even when considering the failures to materialize the Indigenous cosmovision at a larger scale, many marginalized groups such as Indigenous and peasant water users have been essential to the state formation process in Ecuador, contrary to the common vision of simple recipients of state policy (Clark & Becker, 2007, p.4). In this sense, the water reform operating before and within the *Buen Vivir* state model and at different levels of water governance is better understood as the extension of a social, political and economic process of transformation and struggle. The embeddedness of environmental factors in the current Ecuadorian state model is a result of how the Indigenous movement was able to use political openings to push forward their own interests, thus increasing their organizational capacity and experience for greater social efficiency of water management (Clark & Becker, 2007, p.4). In a now very politicized and socialized issue that is water management, they were able to demonstrate by their implication the need for a shift from the economical and productive efficiency paradigm towards an alternative fostering social welfare in rural and peri-urban zones.

Social Efficiency and Social Welfare

The argument of international institutions like the World Bank promoting privatization initiatives in the water sector highlights that the main barrier to proper service delivery in poorer states of the Global South is the inefficiency of the public sector (Spronk, 2010, p.156). This argument finds its basis in the general assumption that the public sector

of “underdeveloped” countries has failed in providing universal access to water services. 7 out of 10 people endangered by a lack of access to water and proper sanitation find themselves in rural and transitional areas where the public services are mostly present (WHO & UNICEF, 2012, p.23). At the international level, just like in the Ecuadorian context, there is a clear need for alternatives in water management that go beyond the public sector.

What these arguments do confirm, however, is that the private sector is not more “efficient” in providing water services. The counterargument is reinforced by multiple revocation of contract following a series of uprising throughout Latin America, Ecuador and Bolivia being very well-known examples of such failures (Gudynas, 2011; Escobar, 2016; Kothari, Demaria, & Acosta, 2015). The private sector has not proven itself more efficient than its counterpart, even though it is considered more performant due to underlying assumption of superiority of markets over a bureaucratic infrastructure under the political control of the state (Spronk, 2010, p.157). When efficiency is being referred to in the water domain, it is often if not consistently related to economic efficiency as per its engrained foundations in the Western modernity. In this context, efficiency is defined as:

> a resource allocation that results in maximized net benefits from the use of the resource. In practical applications, the notion refers to “cost benefits” analysis that attempt to determine the net balance between positive and negative effects of any economic act, event, or institution. If the net positive effects outweigh the negative effects, the act, event or institution is said to be “efficient”. If the net negative effects outweigh the positive effects, the act, event, or institution is said to be “inefficient” (Spronk, 2010, p.159).

Water policies in the neoliberal think-tank reflect the idea that institutions as well as market incentives determine the individual’s activities and the economic efficiency of water control models (Boelens, 2015, p.240). Water users are therefore perpetrated as “rational decision makers aiming to generate net economic benefits in situation of water allocation” (Boelens, 2015, p.240). As a result, water management outcomes are directly related to individual rational decisions based on universally and objectively defined

interests. In this analysis, the lack or absence of market incentives is the main cause of contemporary water issues.

Yet, what this conceptualization fails to address is the socially-rooted nature of water cooperatives in many countries of the global South and thus the aspects of context and culture that, as we know today, have great relevance on how communities manage the common property regimes and what water users in those communities strive to achieve. The collective nature of the Andean water domain, of duties and rights, as well as their diversity and rootedness in local community structures make cooperatives hard to comprehend and analyze through universal criteria (Boelens, 2015, p.241). Nevertheless, compelled by the central omission of contextual factors, a progressive body of scholars emerged stating that the value of the efficiency argument is lodged in what one considers are the standards for a "good society", the measurement of efficiency being highly dependable on the ends of the activity (Lefeber & Vietorisz, 2007; Tverdek, 2004). Therefore, in assessing the impact of Indigenous participation on the efficiency of water service management, there's a strong link with the intended ends of water service management in peri-urban Ecuador. In other words, economic efficiency cannot appropriately lead to the social welfare goals of water services in peri-urban Ecuador due to core differences (see table 1). The assumption of social benefits as the resources' purpose is based on the intrinsic value of nature in the Indigenous *Sumak Kawsay* cosmovision, both at institutional and non-institutional levels.

From this standpoint, a reorientation towards "social efficiency" and social capital is necessary to better assess of the impacts that Indigenous populations can have on water service management. In the last four decades, Andean Indigenous water user organizations (WUOs) regrouping WUAs in Ecuador have been playing a central role in the water management domain as well as in the mobilization of collective action (Hoogesteger, 2013, p.347). This is in line with the political ecology trend using social capital as a framework to examine the formation of WUOs and the role of the latter in water management efficiency (Boelens, 2015; Harcourt & Nelson, 2015). The Ecuadorian WUOs allowed the development of "inward- and outward looking" social capital reinforcing the efficiency of water irrigation system management in specific rural and peri-urban contexts

(Hoogesteger, 2013, p.347). For the intended purposes, social capital is defined as "the stock of norms of reciprocity and networks of civic engagement" (Putnam, 1993, p.171).

Table 1: Key differences between economic efficiency and social efficiency

	Economic	**Social**
Underlying approach	Market-based	Communitarian
Proponents	State, international financial institutions	Marginalized and community groups
Power structures	Vertical	Horizontal
Objectives	Maximized net benefits from the use of the resource	Components of social welfare dependent on ones' standards for a "good society"
Measurement	Net positive effects outweigh net negative effects	Dependent on the ends of the activity
Considers peri-urban constraints to be:	Administrative, financial, legal and technical	Same, but mainly rooted in inequalities and processes of exclusion

Source: table elaborated by author.

In the Ecuadorian water context, this means a reorientation of our understanding of efficiency towards two main components: the sustainable irrigation system management and maintenance through hydraulic property creation capacity and the defense of water rights, and hydrosocial identity through collective lobbying. These forms of collective actions are used as the basis for socially efficient water management and delivery.

Hydraulic Property Creation for Irrigation System Management and Maintenance

A widespread notion in systems managed by water users in peri-urban zones is that actors who invest in the creation of irrigation infrastructures generate property rights related to the water infrastructures that they set up (Coward, 1986, p.493; Ostrom, & Hess, 2010, p.73). As pointed out by Coward, you cannot build facilities without creating property (Coward, 1986, p.492). The creation of the irrigation system establishes

relationships of ownership with the creators, which become the social basis for collective action in the performance of various irrigation tasks (Coward, 1986, p.492). This mechanism for creating and strengthening water rights contributes significantly to the sustainability and efficiency of socio-environmental systems by ensuring the execution of various activities required for the irrigation system operation and management, as well as social conditions of employment, knowledge sharing and basic resource access (see photo 1). These may include intra-community regulation and its application, coordination and conflict management, as well as the mobilization of resources necessary for the maintenance of infrastructure (Boelens, & Vos, 2014, p.58). This ownership creation mechanism also ensures that water users, as collective bodies, will have effective control over the development and application of their system management standards. In this governance mechanism based on water property, each user appropriates rights individually as the community as a whole builds collective rights (Boelens, & Vos, 2014, p.59). From these rights, individual rights of access to water and participation in decision-making are directly linked to the infrastructure belonging to the community and ensure its collective management.

In this governance mechanism based on water property, each user appropriates rights individually as the community as a whole builds collective rights (Boelens, & Vos, 2014, p.59). From these rights, individual rights of access to water and participation in decision-making are directly linked to the infrastructure belonging to the community and ensure its collective management. Typically, in many small-scale irrigation systems found in an Indigenous peri-urban context, financial and non-financial investment can also be inherited by families individually and by the community as a whole. These notions of property are generally respected by the many rituals linked to the practice of irrigation, which are also considered as investments (Boelens, 2015, p.119). After creating property rights, their consolidation by water users is necessary (Boelens, 2015, p.117). This is done again through the logic of investment, therefore acquiring obligations to operate and maintain the irrigation system.

Photo 1: Hydraulic property creation in the Chimborazo province

Source: Boelens, 2015, p.65.

The contribution of collective group work creates and recreates rights. Therefore, the consolidation of water rights implies preserving the physical infrastructure of the works, the natural environment of the hydrosocial territory and social cohesion in order to operate the organizational system (Boelens, & Vos, 2014, p.62). User investment in the construction of irrigation facilities creates intimately linked individual and collective water rights, while user investments of various kinds in water maintenance reaffirm and recreate these water rights (Boelens, Hoogesteger, Swyngedouw, Vos, & Wester, 2016, p.9). The creation of joint water ownership across the three interdependent domains of infrastructure, norms and organization also shows that field irrigation technology materializes rights of use and ownership and conversely, collective water rights ensure the viability of the irrigation system. The interaction between technological and normative spheres ensures the sustainability and efficiency of irrigation systems in terms of access and redistribution benefits.

But in Ecuador, and in the Andes more generally, water rights and system appropriation related to collective work should not be romanticized as a unified body, but rather heterogeneous in essence. Following Indigenous intervention in the water domain, a reorientation towards community coexistence does not imply that internal conflict and opposition do not occur or have been resolved, on the contrary, a new irrigation system

usually creates additional contradictions. Yet, beyond the complexity associated with such heterogeneous groups, many communities understand the process of conflict as a prerequisite to achieve collective management (Boelens, 2015, p.272). The creation and maintaining of collective hydraulic property, embedded in historical traditions and struggles, connected families and their rights to a political and cultural hydraulic identity (Boelens, 2015, p.272). Necessary to collective water management, it is in no way related to a pan-Andean behavioural utopia, rather fosters heterogeneity and multiple realities inscribed in the script of a plurinational Ecuadorian state (Boelens, 2015, p.272).

In Ecuador, despite the recognition of collective rights and the existence of a specific territorial organization for Indigenous populations in the 2008 Constitution, many state interventions seem to ignore such foundations of local management of water resources. The complexity of the situation of the Licteños community demonstrates in a relevant way that a denial of the foundations of local governance based on water property can be critical for the physical and temporal efficiency of an irrigation system. In 2012, the Ecuadorian state irrigation project involving the Gompuene irrigation system in the community of Licto involved the restoration by the state of the previously existing irrigation system under community control (Boelens, 2015, p.45). Since the association of water users and the government agency had not established clear agreements on distribution rights and possible obligations, only the criteria of national nature were enforced and the public management of the resource became even more restrictive, such criteria being contrary to the mechanism of acquisition of the rights of access to water resulting from investment in the irrigation system (Boelens, 2015, p.42). The standards and mechanisms for acquiring water resources through its commodification could not constitute a legitimate acquisition mechanism within the peasant organization in this space (Boelens, 2015, p.43).

During the years following the completion of the Gompuene irrigation system, water was distributed in a disorderly and inequitable manner since it was not linked to the investment mechanism or to the possession of land by various families. In 2015, a study established that only 33% of the Indigenous peri-urban community had access to the irrigation system (Gibson-Graham, Cameron, & Healy, 2018, p.89). User contributions to maintain the system were minimal since the irrigation infrastructure per se did not descend from the creation of water property by the community. The failure of state standards and

policies in the Ecuadorian community context stems from the individualistic nature reflected in the acquisition and application of rights relating to water, this being in opposition to the collective nature of rights in the regime of ownership governing the water resource infrastructure of the Licteños hydrosocial territory (Gibson-Graham, Cameron, & Healy, 2018, p.89).

It is, however, important to emphasize that the common essence of the irrigation infrastructure transmitted by the rights of use and property does not wish to place this argument in the essentialism of the notion of the common or the community in the context Indigenous water (Bakker, 2007, p.449; Ostrom, & Hess, 2010, p.22). This essence rather refers to the fact that an Indigenous peri-urban community of water users in Ecuador, although internally differentiated, requires a collective identity linked to its water sources. It also requires the establishment of a common normative system resulting from its negotiation processes and a physical and social environment, an area of control of territorial waters which must be limited by physical, natural and human borders (Boelens, Getches, & Guevara-Gil, 2010, p.151). The socio-economic homogeneity of these communities and systems remains a myth, but in Patococha for example, Indigenous farmers and mestizos work together to exploit the collective irrigation system. (Hidalgo, Boelens, & Vos, 2017, p.77) In Pugales, as in many other communities in Ecuador, the gender differences in water management are certainly not resolved, but the users, men and women, have demonstrated that collaboration is a prerequisite to building, restoring, affirming and actively defending collective borders (Hidalgo, Boelens, R., & Vos, 2017, p.79).

These geographic and social boundaries must be built collectively to ensure efficiency of distribution and access of the irrigation system and production of social capital. The notions of community and common as a relational process are not rooted in nature but require hard construction efforts. These efforts must collectively create, refine and reaffirm a shared physical infrastructure as well as norms, values, rights and symbols in order to ensure social welfare of water users (Gibson-Graham, Cameron, & Healy, 2018, p.90). Thus, combined with mutual reinforcement between the normative and technological sphere, the emergence of the notion of water identity transcending socioeconomic and socio-cultural differences is one that allows actors otherwise in conflict of interest to align themselves in a relational process that is the common to produce inward-

and outward-looking social capital. Indigenous implication is challenging hydropolitical factors such as irrigation designs, organizational structures and operational norms, and is aligning them with techniques of governance to establish efficient control (Boelens, 2015, p.276). In this case, alternative "social use requirements" are integrated into hydraulic infrastructures and are defying their intended or assumed function to benefit distribution of social benefits. By addressing different dimensions of water management and infrastructure layout, Indigenous implication thus redefine efficiency as having a social means and increases service delivery and access on a specific hydrosocial territory often at a local level.

Collective Lobbying and Defense of Hydrosocial Identity

As indicated in the previous demonstration, irrigation technology is a central point of governance based on water property. It is also a social construct in which social and normative relations between environmental subjects shape infrastructure, irrigation and their organization to achieve social efficiency (Agrawal, 2005, p.182; Huggins, 2016, p.724). Conversely, contributions to the management and maintenance of water infrastructure shape the organizational relationships of community actors, a process essential to the constitution of water identity and "water communities" (Boelens, 2015, p.19). Water rights are able to bring about a water identity both at the community level in the association of the environmental subject with the local hydrosocial territory, as well as other levels through the use of water identity as a tool for resistance against intrusive state policies and initiatives. Thus, the emergence of a water identity ensures the sustainability and efficiency of the irrigation system's management by being both a force behind collective action and allowing its sustainability by ensuring its defense to upper scales.

In this sense, governmentality aims to fundamentally change the identification of local water users to internal and external actors. As emerging environmental subjects, water users have to define their needs, strategies, norms and relationships differently (Agrawal, 2005, p.180). As Cohen points out, to "maximize their efficiency", collectives of water users must establish their membership criteria and their limits, by defining their identity in the political field in which they operate (Cohen, 1986, p.319). As Agrawal points out, environmental subjects govern territories and are governed by new discourses and

ideologies which are called upon to defend policies, authorities, hierarchies and particular water management practices (Agrawal, 2005, p.183). The governance of the hydrosocial territory makes it possible to constitute a truth policy based on standards which legitimize certain knowledges, practices and forms of water governance and discredit others (Huggins, 2016, p.724; Foucault, 1980, p.144). It distinguishes between legitimate and illegitimate forms of water knowledge in relation to its proponents.

In the Ecuadorian context, the Indigenous communities give legitimacy to contextualized and often non-codified collective rights and thereby discredit the formal positive law of the State (Boelens, Getches, & Guevara-Gil, 2010, p.147). Normative discourses on the local hydrosocial territory combine power and knowledge to ensure a specific political order, as if it were a naturalized system, by establishing fixed links and logical relationships between a specific set of actors, objects, categories, hence once again the priority given to governance based on water property (Foucault, 1980, p.137). The Indigenous communities of the Ecuadorian highlands demonstrate that at the limits of interaction between social and environmental dynamics, knowledge captures how power and competing value systems interact to create organized and conflicting spaces (Cote, & Nightingale, 2012, p. 484; Verhoeven, 2011, p.690). In addition, the normative frameworks of water in local daily management constitute a powerful means to challenge the dominant power structures and to favor the Indigenous claims and legitimacy on water resources.

These struggles with dominant forces are based, among other things, on the questioning of the collective rights to water of users of Indigenous communities by national actors. These peoples demand the recognition of territorial rights, an equitable distribution of the resource and the legitimization of local authorities and plural normative frameworks (Boelens, & Doornbos, 2001, p.347). In other words, communities engage in politico-strategic action to defend the rights of access to water, define the rights to control water, legitimize local authority and confront powerful speeches.

Indigenous rights and identities regarding water reveal both historical roots and an important capacity for adaptation. These are deployed as dynamic and hybrid arms in a struggle for recognition of the community, of a differentiated citizenship through water identity, increased participation in the practice of governance as well as redistributive social justice (Hidalgo, Boelens, & Vos, 2017, p.70). The struggles of Indigenous and

peasant water communities in Ecuador provide a better understanding of how the normative mutual ties of both rights, obligations and the feeling of belonging among water users are strengthened, how a common water property is created and reaffirmed, and how water identities acquire their real substance (Boelens, & Vos, 2014, p.60). Thus, the consolidation of water rights and water identities within the framework of a specific hydrosocial territory makes it possible to build and reaffirm social and territorial ties due to the mutual dependence. This in return requires a shared law system and collective action institutions to defend and control certain fundamental resources and common infrastructures (Boelens, & Vos, 2014, p.61). The community is animated by collective water identities which can, in turn, materialize water rights by engaging in collective action strategies.

CONAIE demonstrates how the defense of collective identity through the mobilization of collective rights makes it possible to ensure the survival of the irrigation system under collective control which, as previously demonstrated, has an organizational structure ensuring the sustainability of the activities of irrigation. CONAIE brings together several actors from the Indigenous movement, including, among others, provincial federations, representatives of peasant communities and local water user associations (Perreault, 2003, p.111). By associating peasant demands with those of the Indigenous movement more broadly and by going beyond the scalar constraints of agency, water users succeed in mobilizing a body of collective rights in order to defend the survival of livelihoods and maintain social welfare retribution (Perreault, 2003, p.111). Indeed, local associations of water users will claim their territorial autonomy and water identity through the claims of recognition of a differentiated citizenship, demonstrated by the recognition of the plurinational state in the 2008 Constitution (Ziad, Bernard, Attwell, & Elmarsafy, 2013, p.77; Boelens, 2015, p.227).

This movement, through the mobilization of legal strategies of identity, territorial, economic and social claims, succeeded in inscribing in the text of the law the recognition of Indigenous citizenship allowing the populations concerned to obtain formal tools for the protection of the resource against extractive policies and initiatives, thereby ensuring the sustainability of the resource and protection of social capital (Boelens, Getches, & Guevara-Gil, 2010, p.177). The consolidation of water rights and identity succeeds in

establishing the substance of collective water identities, which is used as tools to protect the resource, ensuring its viability. Recognition of the identity of peoples as well as political autonomy is in the Ecuadorian context two dynamics linked to the struggle for a more equitable distribution of resources and means of production, and are closely linked to questions of water control, formulating water use rights and implementing water policy (Roth, Boelens, & Zwarteveen, 2005, p.59).

Scaling Up of Water Networks

Since the 1990s, there has been a common theme in political ecology and constructivist literatures to use a framework conceiving the different scales such as local, provincial, national and global as socially constructed, a result of the existing tensions between the structural forces and the practices of human agency (Perreault, 2003, p.98; Masson, 2009, p.119). When looking at the peri-urban level of water management, this conception allows us to question the way in which local actors overcome the constraint of scales to develop the agency, and the processes of resizing the State territory and social relations of power (Hoogesteger, & Verzijl, 2015, p.15).

In a desire for political and theoretical non-restriction, it is important to move away from the predefined hierarchical perception of the world in which the larger scales are conceived as more powerful, therefore where the global would be more powerful than the local (Gibson-Graham, 2006, p.186). By adhering to the policy of scales, the resumption of the criticism of Gibson-Graham conceptualizing the flows of power and agency through vertical scales makes it possible to centralize the analysis on the scalar practices of social actors more than on the scale and its structuring as a category of analysis in itself (Gibson-Graham, Cameron, & Healy, 2018, p.88). In this way, the focus on scalar politics allows to understand how local groups and movements, in this case water users, create, navigate and use the different scales in order to defend their interests and therefore work towards greater social efficiency and welfare benefits.

In the context of the movement of water users in Ecuador and in the study of the Indigenous “grassroots” movement as central social actors in the water domain, the peri-urban space as a localized context promotes grassroots territorialization, or the formation of a hydrosocial territory, as well as the development of political agency of the

communities which allows the reconfiguration of the dynamics of social and territorial powers. Marginalized groups will proceed to scale up their interests in regard to water governance through scalar politics as a tool for resistance of the state ordering.

Grassroots Territorilization

As previously mentioned, the decentralization policies of the 1990s in Ecuador motivated the creation of water user associations which gained legitimacy through the years by local people and non-governmental organizations' support. In this sense, the political implications for the Indigenous movement in Ecuador is that natural resources are viewed as a 'commons' and thus, their organization should be done through collective management by people identifying with hydrosocial territories (Bakker, 2007, p.435). Through objectives and needs to collectively create, refine and reaffirm shared material infrastructures, as well as standards, values, rights, identities and symbols emerges an area of territorial and physical water control that needs to be limited by physical, natural and human limits (Boelens, 2015, p.132). These limits must be collectively constructed and thus the community becomes an arena where various actors interact with various discourses in order to establish rights, rules and conditions under which resource management strategies will be implemented (Boelens, 2015, p.133). Through this process, local standards and practices lead to a territorialization centered on water resources and the formation of a counter-territory (Swyngedouw, 2004, p.33). On said hydrosocial territory, the newly developed autonomy and authority of water user associations allowed water users to practice their political agency to surpass the constraint of scale and reconfigure territories and in this case, state ordering of hydrosocial territories (Perreault, 2003, p.98; Boelens, 2015, p.132).

More globally, a central component of water cooperatives is the democratic essence of the management structure through which water user associations and networks are formed, organized and maintained by the populations they serve (Spronk, Crespo, & Olivera, 2012, p.439). The relations constituting those networks, and established on hydrosocial territories, are defined as hydrosocial networks (Boelens, Hoogesteger, Swyngedouw, Vos & Wester, 2016, p.4). By using hydrosocial networks, a link is established between wider scales of politics, economics and environment, and human and

non-human agents. These scales are not set, but rather emerging from tensions between social and environmental processes, and the systemic surrounding forces and pressures (Boelens, Hoogesteger, Swyngedouw, Vos & Wester, 2016, p.5). Hydrosocial networks mobilize traditional and Indigenous knowledges and solidarity work towards a common objective of improving the *Buen Vivir* or "living well" of the local communities they serve. Local associations of water users engage directly with provincial and regional federations of different sizes to maintain their irrigation systems and perpetuate their territorial autonomy (Hoogesteger, J., & Verzijl, 2015, p.17). Not interpreted as a "skipping of the scale," this leap from scale to scale underlines the specificity of the pluralistic Ecuadorian context, where community actors will at times avoid the ordering of the State and its institutions, or otherwise strategically use the larger platforms to broaden the scope of their interests and amplify their voices (Hoogesteger, J., & Verzijl, 2015, p.17; Masson, 2009, p.118). As Fox noted in the context of Mexico, the capacity of grassroot groups to go "up the scale" is essential to the creation of social capital and the associated strengthening of civil society (Perreault, 2003, p.100).

Additionally, addressing the struggle to reconcile the autonomy of community water systems and socio-ecological limitations, the Ecuadorian case offers insights into the way water communities are engaging in scalar politics to reconceptualize said autonomy "as a project of solidarity rather than a project of internal self-governance" (Marston, 2013, p.9). Autonomy built through grassroot territorialization is taken as the foundation of radical politics, which implies recognizing the benefits of strategic institutional relations as well as their long-term impact on decision-making processes. A reconceptualization endeavor ultimately helps to distance the post-neoliberal use of autonomy from liberal references to autonomous subjects, the former breaking the socio-political boarders built by the latter (Marston, 2014, p.83). To navigate such conflictual argument, reinforcing trans-local hydrosocial networks through this process allowing water collectives to voice their interests as a unit is essential. Small-scale water committees have to look outside for support. Therefore, grassroot hydrosocial territorialization is a process re-creating mutual dependency through mobilization concerning a collective resource control and management goal (Boelens, Hoogesteger, Swyngedouw, Vos & Wester, 2016, p.5). In Ecuador, *Interjuntas-Chimborazo* and Center for Support for the Rural Management of

Drinking Water (CENAGRAP) are examples of alliances where water committees are interacting to create a "spatially open conception of autonomies, one that takes socio-ecological processes into consideration and seeks to build community solidarities rather than community autarky" (Marston, 2013, p.9).

In a context of post-neoliberal resource governance, an important component in assessing the relative success of a pathway such as the *Sumak Kawsay* model is in its capacity to answer the scale and "materiality" of the resource issues (Marston, 2013, p.9). In regard to the water domain, it revolves around the context-specific interactions between a post-neoliberal model and socio-natural factors. In relation to the water users' collectives in Ecuador, the interaction between rapid urbanization and the creation of peri-urban zones and the hydrological cycles is central. Water's tendency to circulate makes it unsusceptible to privatization, marketization, and commodification (Bakker, 2007, p.437). For similar reasons, on the one hand, it is hard to manage independently in peri-urban zones or local scale. One association of water users cannot individually address the issues of water quality and access inequalities cascading from broader scales of water governance. This is when, in order to ensure the social and physical efficiency of water infrastructure and management, local actors choose to engage in multiscalar relations.

Scaling Up of Local Water Governance

The struggles for an alternative territoriality often involve building and engaging in new multi-scalar networks, which links local communities to translocal actors and alliances. In the Ecuadorian environment, despite the fact that local associations of water users are creating strong social and spatial ties with federations, confederations or platforms at higher levels, they neither become dependent on nor are shaped by them (Boelens, 2008, p.57). Concretely, it even proves relevant to defend the reverse process. Legitimacy and representativeness and ultimately the power of these federations and platforms depends on local actors and on their mobilization and participation at larger scales (Boelens, 2008, p.59).

In the province of Chimborazo, this was made possible due to the long history of mobilization and the contemporary predisposition of local social actors to take part in collective action, combined with legitimate leadership and support from surrounding actors

such as NGOs (Hoogeseteger, 2012, p.84). Looking into the further explored case of the Licto community, this exemplified by the way the local Gompuene irrigation system creates constant interaction and relations between eight neighboring communities and the water users in those communities, those joining the larger Ceceles-Guarguallá canal, then the broader provincial federation *Interjuntas-Chimborazo* to eventually make its way to the national water forum (Boelens, 2015, p.296). Additionally, the national-level Indigenous organization has set Ecuador apart in the Latin American continent. Indeed, *el Foro de los Recursos Hídricos* is a national multi-stakeholder platform with an explicit anti-neoliberal agenda to debate the issues and generate proposals relating to the management of water resources (Perreault, 2003, p.100). It has gained significant political space in the field of water service management in Ecuador. This platform has contributed to many changes in national water governance. It presented several proposals for legal reform to the national congress and participated in the inclusion of requests from constituent organizations in the 2008 Constitution (Perreault, 2003, p.102). Through this process, a large stock of social capital is constantly created among a very wide range of actors. This gives the possibility to many social actors to exercise political action through these networks (Perreault, 2005, p.280). This platform expressed the concerns of many peasant and Indigenous communities and has become a place through which these develop political activity on several levels.

The formation of translocal networks linking peasant and Indigenous irrigators with national NGOs, academics and political activists allows these irrigators to jump ladders through the organizational system, while affirming the importance of the local and a collective water identity (Perreault, 2003, p.98). In return, this makes it possible to pay particular attention to the fact that spatial scales, therefore the levels of social praxis and interconnection, are not fixed or preordered there, but rather produced, contested and reconfigured through several actions to larger scales and forms of daily practice (Boelens, 2015, p.259).

In this manner, it is important to understand the ways in which the community space characterizing the peri-urban areas and other scales are simultaneously reinforced and transcended by the actors forming the networks of the Indigenous social movement in what Swyngedouw calls a rooted translocalism (Swyngedouw, 2004, p.31). In this regard, local actors execute a leap of scales as a strategy of protest in order to widen their spatial,

social and political scope. Implication of Indigenous and marginalized groups in such political strategy can position scale to be conceptualized as essentially relational rather than strictly hierarchical, thus bringing a vision that destabilizes the false associations of the global as holding power and of the local as being dispossessed (Gibson-Graham, 2006, p.287). Indigenous implication in water management issues brings back the political agency to peri-urban and local levels of action. Andean water collectives' ordering of redistribution, recognition and democratic representation are emerging as political results of grassroot struggles rather than being an impartial input from policymakers (Boelens, 2015, p.297). The Licteños case demonstrates the capacity of water users to gather in order to oppose the State and its practices threatening their "heterogenous unity" by putting pressure on the irrigation system comprised of infrastructure, rights and governance. The failure of the Ecuadorian state system's interaction with collective water systems, or pluralism with no reciprocity, is currently translated in the failures of the *Buen Vivir* model and in the rejection of state interference in local and communal water organizations. Such lack of trust is mainly due to centuries of colonialism and its remaining influence in the past four decades of privatization and weak governance (Spronk, Crespo, & Olivera, 2012, p.440).

In this way, the different scales reconstructed by water users in the process of defending water use rights and identities redefine multi-scalar structures and "bottom-up" hierarchy traditionally embedded in power relations. The use of scalar politics by Indigenous groups as well as its success in voicing interests at a broader level is rendering socially efficient water management if we follow Swyngedouw's affirmation that:

> the social power that can be mobilized is dependent on the scale or spatial level at which social actors can operate. Consequently, the success or effectiveness of social and political strategies for empowerment is related to the ways in which geographical scale is actively considered and mobilized in struggles for social, political, or economic resistance or change (2004, p.26).

Recalling the definition of social capital earlier described as "the bonds of trust and reciprocity that inhere in civic engagement and collective action," the construction of social

capital and production of social welfare is perceived as a direct cause of enhanced livelihoods and economic development (Perreault, 2003, p.100). This lens highlights the power of such multiscalar networks to strengthen the ability of water user groups to empower their political claim and influence market structure and institutional accountability by the mobilization of social actors at various levels of social action.

Case Study: The Chimborazo Province

The province of Chimborazo has the highest concentration of Indigenous people in all of Ecuador. In the highland province, the peri-urban Licto District counts 28 Indigenous communities and 90 percent of the population would identify as Indigenous (Boelens, 2015, p.175). The other 10 percent are the white-metizos elites who were historically controlling markets and even stealing crops and animals to sell at higher prices. They gravely increased scarcity amongst Indigenous communities and left a deep trail of oppression (Boelens, 2015, p.175). But most of all, the province is known for its rebellious history (Clark & Becker, 2007, p.10).

For the past four centuries, the highland province of Chimborazo has been under the control of the *hacienda* system oriented toward food and crop production, and framed by relations of production (Hoogesteger, Boelens & Baud, 2016, p.99). The 19th-century rapid urbanization process in the Andes increased the rapidity of capitalist modernization of the *haciendas* in the Ecuadorian highlands while simultaneous peasant migration crumbled down the established power of *hacienda* owners. Notwithstanding the agrarian reforms prior to the 20th century, the most important challenge to the system came from Indigenous political mobilization led by the communist Ecuadorian Indian Federation in the mid-1940s (Dupuis, 2018, p.101). They allied the “disunited and submissive” Indigenous peasants into organizations of *hacienda* unions mainly fighting for wage and land issues (Dupuis, 2018, p. 103).

Although this concluded in an economic defeat, as only 3 percent of the lands were transferred to Indigenous and peasant owners, it was a strong political-organizational victory where there was an explosion of Indigenous community organizations and alliances with peasant groups (Korovkin, 1997, p.29). This renewed vitality of Indigenous knowledge and communal traditions is rooted in both a precolonial past and the colonial

experience. The growing Indigenous community movement in Chimborazo opened the local political arena especially in relation to land and resource management. Following Ecuador's changing socio-political landscape of the past four decades where a transformation from exploitation to market-based marginalization took place, the multiple demonstrations of resistance to the remainings of the hacienda system and its embedded "modern relations of production" were observed at the local level (Swyngedouw, 2004, p.31). Indigenous and peasant struggles such as the ones in the Licto District were strong (Boelens, 2015, p.176). Many rural development initiatives wanted to foster "progress" in the province, and the large-scale Integrated Rural Development project aimed at building the Guarguallá Irrigation System is a clear demonstration of the impact of Indigenous groups in water management outcomes regarding social efficiency (Boelens, 2015, p.177).

Licto and the Guarguallá Irrigation System

In 1990, the Indigenous Corporation of Peasant Organizations of Licto (CODOCAL) handling local resource development for agriculture was asked to join partners such as INERHI, the Swiss Agency for Development and Cooperation (SDC), and the national Ecuadorian Agricultural Service Agency (CESA) to take part in the Guarguallá Irrigation System project designed by the Quito-based institute (Boelens, 2015, p.177). While INERHI was responsible for the construction of the hydraulic infrastructure, CODOCAL and CESA were in charge of the implementation. The canal's plans had been conceptualized through aerial photos as well as physical and technical criteria established with the white-mestizo elite in Licto. The official model followed the national design standards generalized throughout irrigation systems in Ecuador and did not address local specificities and realities. Adding to the fundamental error of the development project regarding the separation between design of the physical infrastructure and the organizational capacity building, INERHI's blueprint design came from outside private corporations resulting in major cost overrun, poor-quality canals, corruption and major delays (Boelens, 2015, p.178).

This Western hydraulic engineering dream scheme kept Indigenous water users out of decision-making and water system design, completely disconnecting the technical efficiency from social processes (Boelens, 2015, p.178). It is a clear demonstration of the

obliviousness of national and governmental agencies to the impact of technical factors on labor processes such as scheduling, authority parallel to existing Indigenous leadership structures, future distribution of benefits and associated *mingas*, and overall social organization (Boelens, 2015, p.178). On the other hand, when it is understood that technology has built-in water rights and related management structures, its use and control becomes "a structural and cultural invasion, an invasion possibly more insidious than colonialism and neo-colonialism, because such invasion is not always accompanied by a Western physical presence" (Galtung, 1979, p.286). Not only did the lack of attempt to include community norms in standard design, territorial boundaries and Indigenous customs and knowledge resulting in the failure of the Licto-Guarguallá irrigation project, it motivated the Licteños' water users to challenge the restructuring of their hydrosocial territories encompassing the infrastructure, organization and governance of the water resource to address the encompassed social welfare and benefits dimensions (Boelens, 2015, p.260). Their political project was now based on defying and reclaiming identities assigned to them by elites and pan-Andean ideologies. They did so by participating in a reorganization of collective water management and in networking strategies to answering the efficiency deficit.

Indeed, the irrigation system was redesigned by local water user organizations, modifying the layout and dimensions of the canal in 2013[4] (Boelens, 2015, p.277). Scheduling irrigation patterns were reorganized according to local necessities and demands. CODOCAL included in the design plans night-storage reservoirs instead of the traditional nocturnal irrigation in order to increase safety for women users and thus address the gender dimension, considering the fact that women are the main resources responsible for farm and house irrigation in Licto (See photo 2; Boelens, 2015, p.160). Traditional training methods, such as topographical maps and technical designs that were useless for generally illiterate female, were replaced with special assembly debates, capacity-building exercises and exchanges with various user organizations (Boelens, 2015, p.279). It opened space for them to share gender barriers and biases in the Licto irrigation system, which as a result led to gender-specific solutions such as pregnancy leave "without losing the water rights from the *mingas* they would miss" (Boelens, 2015, p.285).

[4] See appendix B for a map of the Licto-Guarguallá irrigation system.

Consequences of this redesign was increased operational flexibility, independence of water users and overall water security (Boelens, 2015, p.160). Deviating from technocratic answers, moralizing such processes was not out of grasp but rather based on the user's perception of actual water control issues and solutions. In giving back its moral character to the previously established design, the Licteños are "context-embedding" efficiency in local Indigenous decision-making and non-universal water knowledge and "truth production" (Boelens, 2015, p.280). From that moment on, water management governance was organized in accordance with community structures fostering social benefit as well as water distribution. This served as a readjustment in accordance with water user collective's "socio-territorial rights" (Boelens, 2015, p.277).

As previously mentioned, the collective water rights related to the Gompuene canal were shared by not only the Licteños, but by eight surrounding communities expanding their water networks to various scales, including the provincial federation of *Interjuntas-Chimborazo.* Following the implication of Indigenous groups, the Licto case indeed demonstrates the possibility of a shift from a "productivist to a socio-territorial and rights creation-based approach" to water management (Boelens, 2015, p.277). What the Licto example also allows us to conclude is that there is a need to challenge the assumptions carried by most external policies that efficiency is related to fixed rules and universal patterns of governance enhancing resource control and oriented towards production. In Licto, the productivist approach to water governance established by State agents in order to create bureaucratic control was unresponsive and thus turned by water users to achieve social efficiency of water management by working toward their own political and socio-technical project (Boelens, 2015, p.297). They redefined the strategies to water management through sociotechnical and political actions to materialize their interests identified under the banner of social efficiency and welfare. Through the Licteños case study, water rights and identity are used as tools to fight social power relations within the Ecuadorian water domain, and social efficiency of water users is thus increased due to the ability to defend Indigenous and non-Indigenous water identities. Licto water identities are not simply local, but rather position themselves within larger structures of water governance and they do so by engaging with external actors.

Photo 2: Women overseeing community-controlled water distribution in Chimborazo

Source: Boelens, 2015, p.35.

Interjuntas-Chimborazo

When engaging in broader water governance structures through scalar politics, Indigenous groups as main water user groups enable civil society negotiation and counter-power to the dominant water scheme. In Ecuador, in order to face the creation of the *Corporacion de Desarrollo Regional de Chimborazo* (CODERECH) as a corporate institution in charge of water management projects and the construction of water infrastructures during the process of decentralization of governmental institutions in the 1990s, 280 inter-community organizations including Guarguallá-Licto came together over the course of a few years in the Chimborazo province to eventually create the *Interjuntas* organization of Chimborazo in 2001 (Boelens, Getches & Guevara-Gil, 2010, p.295).

These water-user organizations, mainly composed of Indigenous communities and small-farmer constituencies, are aiming to increase capacity of water users to represent and defend their water rights while providing bottom-up advocacy for political and social welfare conditions (Boelens, Getches & Guevara-Gil, 2010, p.296). Increased capacity for action establishes a platform for water system user organizations to discuss, negotiate and achieve consensus. The *Interjuntas* federation is dealing with conflict management within its members and other systems, between marginalized populations and elite landholders, as well as between Indigenous peoples and the Ecuadorian State advocacy (Boelens, Getches & Guevara-Gil, 2010, p.296). Dealing with such power dynamics, the federation has its own centre for defense of rights and conflict mediation, allowing groups such as water user families to have their demands represented pro bono. Community leaders have the chance to challenge national power structures and main water policies.

In recent decades, this platform became essential in Ecuador because of greater conflicts on water rights due to an important decrease in availability of water and a stronger competition for the resource between local communities and new and more powerful users. The following is an example of the central role *Interjuntas-Chimborazo* played in the country's water governance domain. In 2003, its State counterpart, the Chimborazo Water Agency, lost legitimacy in the province because of its inability to provide adequate mediation and rulings of water injustices based on numerous cases of bribery and discriminatory practices related to gender and class (Boelens, Getches & Guevara-Gil, 2010, p.297). Nina Picari, Indigenous leader and ex-public servant for the Ecuadorian government, explained quite clearly the vision of Ecuadorian decentralization processes expressed by marginalized groups: "Decentralization, according to the Occidental modernization model, may redistribute decision-making geographically, but the way decisions are made remains hegemonic" (Boelens, Getches & Guevara-Gil, 2010, p.297).

Such neoliberalization of water governance failed its purpose of efficient water management by reproducing hegemonic patterns of marginalization of Indigenous peoples. The resulting unfair allocation of water rights led many Indigenous and non-Indigenous communities and districts of the Chimborazo province to engage in collective action and scalar politics through the users' federation in the following years. This mobilization first served to establish a precedent in court against the Water Agency director and it allowed

in 2006 a public selection process supervised by *Interjuntas* to replace the Water Agency management staff. This was following a second wave of resistance and surveillance of the Water Agency's actions by water user organizations comprised within *Interjuntas* (Boelens, Getches & Guevara-Gil, 2010, p.297).

From that moment on, the provincial federation became a part of the CODERECH council, and actions and decisions emerging from the new administration were being supervised by *Interjuntas*, giving water-user groups a more institutional platform (Hoogesteger, 2012, p.82). This process is now what can be characterized in grassroots politics as the establishment of "a preventive and bottom-up process of *veeduría social* (social oversight)" (Boelens, Getches & Guevara-Gil, 2010, p.297). Pursuing an overview of these authorities by grassroots Indigenous groups, either by tracking their activities, collectivizing and mobilizing, is essential to achieve political accountability, distributive justice and overall respect for water management systems and rights of Indigenous and peasant populations.

Following the failures of the decentralization process in Ecuador, Indigenous participation increased citizen involvement in regard to decision-making and redistribution of water resources, not only increasing retribution of social benefits but also making *Interjuntas* a recognized actor of the water domain at the national level (Hoogesteger, 2012, p.82). Indeed, water quality and access and the associated rights were now being defended at the local, inter-communal and provincial levels with *Interjuntas*, and even at the national level through an association between *Interjuntas* and *Foro Nacional de Recursos Hídricos*, the national civil society platform (Boelens, Getches & Guevara-Gil, 2010, p.298). In recent days, the organization continues to analyze overall state irrigation and water management policies in accordance with social and political benefits of water user groups and communities, constantly revising the debate on whether or not water user organizations as a whole should accept the state-governed water management transfer program. These revisions have multiplied the confrontations with the state irrigation agency and eventually have led to intense mobilizations. The mobilization of water user groups in 2009 in the province is an excellent example where groups such as Guarguallá-Licto joined representatives of other provincial federations, such as Cotopaxi, to block a new irrigation

policy initiative, succeeding in defending the autonomy over hydrosocial territories of thousands of local water user groups (Hoogesteger, 2012, p.83).

The dense multi-scalar water network in Ecuador represents a central strategy of the Indigenous groups to defend water rights and water management structures in order to provide stable outcomes and overall social efficiency for the communal organizations such as the one in the peri-urban Licto District. Rather than being perceived as an existing starting point for water policy and overall decision-making, representation of marginalized groups such as local water users at larger levels of governance in Ecuador is the result or political outcome of Indigenous grassroots struggles and implication in water management issues. When choosing to engage with larger-scale organizations such as *Interjuntas-Chimborazo*, they have great potential to challenge and mobilize against hegemonic power structures. They facilitate local political agency in its transition from basic participation in government or social and political programs to embracing an active role in the elaboration and implementation of water policies, even without access to formal or institutional participatory spaces (Hoogesteger, 2012, p.83). These platforms establish their own permanent spaces where water collectives can do more than simply aspire to participate in water governance.

Through multi-scalar strategies, social actors enhance effectiveness in regard to water right demands and establishing solid basis for a stronger and larger political-legal network (Boelens, Getches & Guevara-Gil, 2010, p.301). The latter can either take the form of horizontal relations with other grassroot organizations or vertical relations with different level organizations such as *Foro Nacional de Recursos Hídricos* or the global water movement, a direct outcome of the translocal and transnational character of water issues and the transnational nature of grassroots groups' opposition (Boelens, Getches & Guevara-Gil, 2010, p.301). Without taking credit away from participation of grassroots groups in formal platforms, it can be argued that it is more effective to create and strengthen "bottom-up" water user federations than consolidate formal spaces of participation within institutionalized structures of power (Hoogesteger, 2012, p.83). Their autonomy and capacity for representation appear more efficient in regard to social democracy in water governance than institutional arrangements or contracts for participation. In the Ecuadorian case, this mobilization capacity presented by Indigenous populations either at a local,

provincial, regional or even national level enables change in water management governance through the advocacy work for the return to "public ground" foundations, influencing institutional reforms and socio-economic relations and benefits.

Conclusion

The emergence of the discussion over the conceptualization of efficiency in academic debates more broadly is lodged in the "hypocrisy of power/knowledge-based rationalizations embedded in so-called universal rationality" of the water domain (Boelens, 2015, p. 298). Indeed, the westernized dominant rationality of economic efficiency has fallen short of its promises in terms of guaranteeing access to high-quality services in the global South and has not been functional in Andean practices, as demonstrated in the Ecuadorian case examined. Its given definition reflects a conflict between outside driven domestication and locally built autonomy, between the State's dominant socio-political views and local strategies of resistance lodged in the *Sumak Kawsay* (Boelens, 2015, p.298). As Lefeber and Vietorisz bring forward in parallel with the critique of the notion of economic efficiency:

> Efficiency for its own sake cannot be a policy goal. Social concerns range over broad social and political-economic areas, some of which may conflict with each other. Policies and implementation must take this complexity into account… There is a need for other, different criteria for efficiency policy formulation and implementation, criteria that are suitable for the pursuit of diverse goals, such as equity, stabilization, and social and environmental sustainability (2007, p. 139-140).

These different criteria for efficiency measurement are a reflection of the built-in social factors of the water domain in peri-urban communities in Ecuador. Understanding that the Ecuadorian water landscape is "a historically specific configuration of practices and ideas" mainly organized by Indigenous and peasant groups, the water domain has reflected built-in social factors that are allowing to question the need for alternatives in efficiency of water management (Clark & Becker, 2007, p.5). Coming from communal

Indigenous tradition, those social factors organize water user communities when maintaining the irrigation system, structuring representation conditions as well as water-access elements, and most of all fostering benefit distribution (Boelens, 2015, p. 298).

Therefore, when answering how Indigenous groups influence the efficiency of water service management, components such as hydraulic property creation for irrigation system management and maintenance as well as the defense of a hydrosocial identity, all of which are being voiced and defended at larger scale of water governance, are brought forward. These conditions characterize social efficiency in the Ecuadorian peri-urban context. These elements of social efficiency are creating context-specific social capital, here grouped under four banners listed as follows. The irreplaceability of the physical and technical ties coming from irrigation infrastructure and flows, all to protect and maintain access to water; the emergence of a communal normative framework supporting collective action; the acquiring of organizational and technical skills in regard to water service management; and the creation, maintainance and reinforcement of relations with different scales of water governance (Hoogesteger, 2013, p.352).

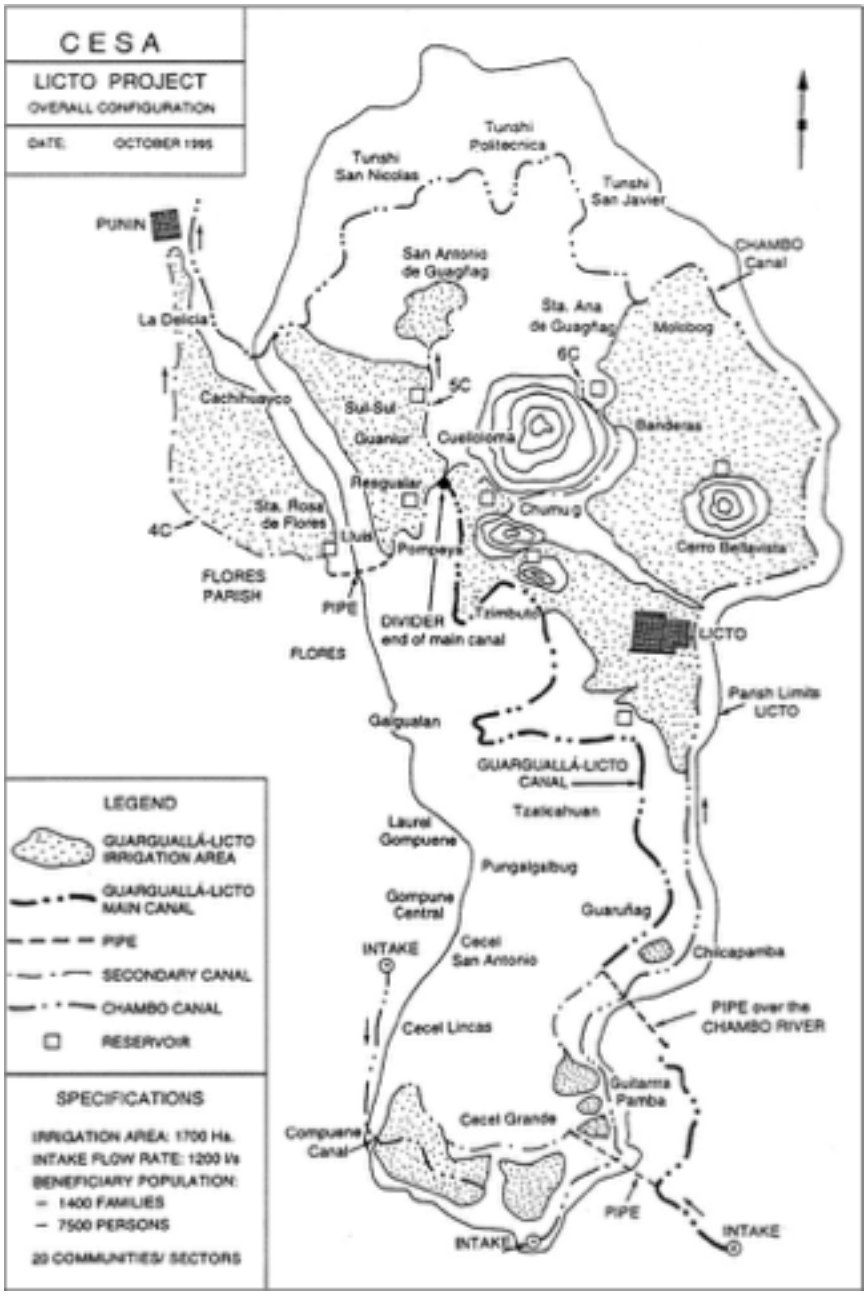
In a state where *Buen Vivir* has captured the popular imagination but failed in its implementation, Indigenous groups have filled, at a peri-urban level, the role associated with public water providers which is to guarantee their political legitimacy by ensuring the well-being of water users, one that is inscribed in the *Sumak Kawsay* model (Spronk, 2010, p.161). This has been demonstrated especially in the case of the Licto District both at the local level and following the association of their WUO to neighboring communities to create *Interjuntas Chimborazo*, at the provincial and national levels. In this specific case, community space as the central element to this territorial organization is the basis for scalar strategies and becomes the site for the development of political activity in water communities. Through scalar policies, local authorities use material and discursive practices and strategies to challenge dominant territorialization policies and claim economic redistribution, cultural recognition, political legitimacy and democracy.

In positioning this work as critical of "rational reforms" and policymaking based on economic efficiency, neutrality and laws of nature, it strives to demand new ways of thinking about water issues. Ways in which putting into question the imperative rationality of water is not seen as "irrational. In which "remoralizing" irrigation infrastructure and

technologies are not a “revolt against reason” (Boelens, 2015, p.322). Highlighting the fact that Indigenous implication in water service management does not answer all water distribution and quality issues, what this work is advocating for is to put forward the right of water users to self-define roots of water problems and pathways for solutions.

Appendix

A. Licto-Guarguallá irrigation system map



Source: Boelens, 2015, P.179.

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