Communitarian water providers in peri-urban areas: the case of Cochabamba water cooperatives

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Abstract

In the cities of the South, water services in neighbourhoods of the poor are often obtained through self-managed organizations. This thesis aims to analyse the way in which these communitarian organizations influence the pattern of urban water governance. I define water governance as comprising state and non-state actors, institutions, practices, visions and discourses whose interactions, clashes and collaboration determine how, where, why, and by whom water and sanitation services are distributed. My fieldwork was conducted in Cochabamba, Bolivia, between September 2013 and September 2014. I carried out 44 interviews with state officials at different levels, leaders of 21 water cooperatives, as well as in-depth case studies in two water cooperatives. This was accompanied by mapping exercises, which allowed me to better place cooperatives in the territory.

Analysing the case of the water cooperatives of Cochabamba, I argue that water cooperatives partially resist the attempt of the state to exercise power over their material waterscape, while also presenting alternative visions of how water provision should be carried out, both as single entities and through networks. Those two elements are fundamental for the dialectic built between the cooperatives and the state, which present instances of both conflict and cooperation. I argue therefore that communitarian organizations are not just subjected to larger-scale processes and powerful actors but that they can exercise agency and influence patterns of water provision.

To understand how cooperatives influence water governance, I firmly ground actors and institutions in a waterscape. Control over their waterscape is a key component of the cooperatives' capability to influence governance at a higher scale. I argue that the relationship between a cooperative and its members is fundamental for the capability of a cooperative to control, modify and maintain its waterscape. Such a relationship is often based on the feeling of ownership of the members over the cooperatives, a feeling that was created through the history of the cooperatives.

This thesis establishes the usefulness of analysing different scales and spaces to understand water governance in an urban setting. Only by analysing the different histories, forms of control, and visions of actors at different scales is it possible to understand how and why communitarian organizations shape urban water governance.

Table of Contents

List of Tables

List of Figures

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Author declaration

“I declare that, except where explicit reference is made to the contribution of others, that this dissertation is the result of my own work and has not been submitted for any other degree at the University of Glasgow or any other institution.”

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Introduction

This thesis examines water governance in Cochabamba, Bolivia, by explicitly addressing those organisations that operate outside of direct state control. Water governance in this dissertation is understood as being a deeply political affair, in which different providers, visions, and systems of regulation coexist and, at times, clash. In the Cochabamba conurbation, both communitarian and state organizations provide the water and sanitation service and therefore contribute to shaping its water governance. In such a situation, the state does not have complete control over the way governance is shaped, and independent providers also assume an important role. This thesis, therefore, investigates the role of these organizations in water governance.

Rationale

Communitarian and small-scale organizations in the South of the World have a fundamental importance in providing water service in areas that have been neglected by the state, often due to disordered processes of urbanization. In the urban South, in fact, polarization in access to sanitation services worsened starting in the 1970s with the growth of slums (Gandy, 2004, p. 372), cutting part of the population, often the most vulnerable, from access to piped water. Alternative methods for water access have growth including water trucks, small-scale sellers of water, artisanal wells, and small-scale networks (Allen et al., 2006, p. 334). Hence, small-scale, informal, communitarian providers are diffuse in the South of the World, as they are one of the ways in which the urban population accesses water services where formal provision is insufficient or absent (Allen et al., 2006, p. 334; Bakker, 2010, pp. 23–24). Such is the situation in the Cochabamba conurbation, posed in the Cochabamba valley, Bolivia.

The inhabitants of the Cochabamba conurbation access water in different ways. Some receive water from a municipal company, others from communitarian providers, privately owned water trucks, natural water sources, or private wells. This dissertation focuses on communitarian water providers. Spronk, Crespo and Olivera (2012, pp.18-19) describe “communitarian systems in peri-urban areas” in South-America as systems built by the people residing in rapidly growing peri-urban areas as a response to the absence of the state.

Such systems are characterized by small scale and a sense of ownership over the system by its users. Similarly, I use the term "communitarian" as it is usually conceived in Bolivia, to say water and (more rarely) sewage systems that are built[1], managed and owned by rural communities and urban neighbourhoods to respond to their own water needs. While I acknowledge, therefore, the existence of debates over the notion of "community", in this dissertation I use the term communitarian following local usage.

In the seven municipalities that compose the Cochabamba conurbation, more than 600 communitarian organizations supply potable water to approximately 58% of the population, while the 4 municipal operators provide it to only 26% of the population (PMMC, 2013, p. 55). These communitarian providers have been fundamental in offering the service in a sprawling conurbation where large peri-urban areas have never been reached by a municipal water entity. The Cochabamba heterogenous and continuously growing process of urbanization then offers a good case study to understand how different communitarian organizations interact and are influenced by the physical and social characteristics of the conurbation. This allows me to place the management of water by the cooperatives in a geographical and historical context, linking it with larger processes.

However, the main aim of this dissertation is not to understand how these organizations provide the service but what is their role in the wider governance of the conurbation. Cochabamba is a particularly interesting case for looking at this issue because the heterogeneous Cochabamba conurbation allows analysing how communitarian organizations and the state influence the waterscape and each other in different spaces and scales. Furthermore, under the Morales government, the state has been expanding its power in the conurbation's water sector through the construction of water infrastructures and the formalization of communitarian water providers. These changes – along with the ensuing debate over the shape water governance should assume in the future – offer points of tension and debate that underline the political nature of water governance. In this situation, it is then important to understand how and why communitarian providers exercise power and to examine their influence in the overall shape that water governance takes in the conurbation.

[1] With this I do not mean that such organizations do not receive external support to build and improve their system. This is, in fact, often the case in Cochabamba.

To explore this subject, I chose to investigate the water cooperatives operating in the Cochabamba conurbation. Communitarian providers there assume different organizational forms. Some systems are managed through formally recognized neighbourhood councils or independent water committees, while a minority operates through a water cooperative (these are often better-established ones). For various reasons, water cooperatives represent a good case study to investigate water governance in the Cochabamba conurbation. They are generally old, thus providing historical perspective; they are scattered around the conurbation, therefore helping me to examine their relationship with different municipalities; and they are organized in a federation, therefore allowing me to investigate the role of networks.

Research Questions

To analyse the way in which cooperatives influence urban water governance in the conurbation, I pose three different questions.

My first question is the following:

- *How do cooperatives protect and further their role as water providers?*

Addressing this question helps me understand how cooperatives exercise power over their territories and to identify the sources of such power. Furthermore, I can identify how cooperatives look at their role and see how this vision is developed. Investigating these issues is fundamental for my overarching research aim for two reasons. Firstly, I can analyse how cooperatives exercise water governance in limited spaces and at the neighbourhood level. While this power is not an active attempt to influence the conurbation water governance, it does influence overall governance, both by modifying the material landscape and by influencing and limiting the way in which the state and other actors see and act on it.

Secondly, by answering this question I can discern how and why cooperatives exercise power in the conurbation.

My second research question focuses on the state:

- *How do state institutions affirm their role in the water sector?*

Understanding how the state sees its role in water governance, and specifically in bringing water service, clarifies why certain legislations and infrastructural works are prioritized and executed. Additionally, understanding how they see and represent their role also allows me to comprehend how the state relates to and represents water providers. Furthermore, I can understand the means through which the state exercises power in water governance. Finally, viewing how the state officials represent their roles allows me to investigate differences in visions and roles amongst state organizations, along with the possible repercussions these differences have on their relationship with communitarian providers. The state is therefore not considered as a unified actor, and posing this question allows me to underline differences between state organizations at different scales. Overall, this research question allows me to explore how the state exercises governance in the conurbation — in which spaces, in which ways, and for which reasons.

My third research question is as follows:

- *How do the state and cooperatives interact in the water sectors?*

This research question enabled me to explore how water cooperatives exercise influence on a higher scale than their area of service, either by limiting the influence of the state in certain territories, creating networks capable of influencing state policies in the conurbation, or proposing alternative models of governance. I furthermore explore how the state influences the cooperatives and in which ways they react to such influence. Overall, I can then understand how the state and the cooperatives influence and limit each other's capability to control water governance in the conurbation.

Theoretical framework

Water governance in the conurbation is the result of the interaction of different actors, at different scales and in different places. This set of factors has determined how water is managed and distributed, by whom and for what reasons. Therefore, I need to understand the reasons why these actors behave in various ways, how they interact, and the consequences of these actions and interactions on the territory of the conurbation. To understand how communitarian water providers contribute to shaping water governance, I used a framework of analysis that enabled me to both explore the interaction between actors working at different geographical scales and the deep relationships that communitarian providers create with their territory.

My framework of analysis, therefore, encompasses the dimensions of territory and scale. Territory is necessary to examine the strong connection between providers and their material landscape and how it was created, as well as the power exercised by the state through material modification of the territory. The concept of scale is necessary for understanding the interaction between different actors at different geographical and administrative levels. Furthermore, I needed to consider the role of networks to grasp the strategies through which the cooperatives interact with the state and control their water sources.

To allow for a more in-depth examination of the dimension of territory in relation to water governance, I decided to examine it using the two complementary concepts of waterscape and hydro-social territory. The concept of waterscape permits me to analyse how water systems and society co-create both each other and the material landscape; while with the concept of hydro-social territories, I can analyse how these waterscapes are conceived by different actors.

In this dissertation, I then needed to combine these four frameworks of analysis: scale, network, waterscape and hydro-social territory. To analyse the various interactions between them, I adapted the ‘territory-place-scale-network’ (TPSN) framework of Jessop et al. (2008: 390), which argues that socio-spatial dimensions such as these are ‘closely intertwined’, both theoretically and empirically. The TPSN framework then facilitates the

analysis of ‘mutually constitutive, and spatially intertwined dimensions of socio-spatial relations’ (Jessop et al., 2008: 389). These authors themselves encourage the addition of different socio-spatial dimensions, as well as the possibility of using only a few of them. Therefore, I modified their framework to suit my research better. To this end, I substitute in the TPSN framework, the concepts of territory and place with those of the waterscape and hydro-social territory. Waterscape is the result of the interactions between society, water and landscape, while hydro-social territory is used to signify the different visions and knowledges over the waterscape. Using these two concepts I introduce the mutual interactions between actors, natural resources, and the physical landscape in the analysis. With this modified framework, I then put different methods of analysing water governance into relationship.

Methodology

To carry out my research, I explored how various levels of the state influence water governance and control the waterscape, how cooperatives carry out governance in their waterscape, and how different levels of the state and the cooperatives interact. My research design, therefore, aimed to enable me to explore multiple scales and spaces in the conurbation. To this end, I used qualitative mixed methods to carry out a research that was multi-space and multi-scale in nature.

Hence, I carried out in-depth case studies in two water cooperatives, and these included participant observation, interviews and document analysis. I interviewed in total 127 respondents in the two cooperatives, including both water users and cooperatives directors and employees. This approach allowed me to examine the relationship of the cooperatives with their waterscape and with their members, along with how they conceive their role and interact with other territorial actors. To understand how the cooperatives are embedded in the conurbation’s waterscape, and how they view and act on it, I held in-depth interviews with representatives of the cooperatives active in the conurbation, carrying out interviews with representatives of 21 cooperatives. To clarify the role of networks, I also examined the Federation of Water Cooperatives of the Cochabamba Department (FECOAPAC). To comprehend the role of the state at different scales and in different spaces, I interviewed 44

representatives of the state at various levels, from municipal water providers to the Vice-Ministry for Potable Water and Sanitation.

Main findings

Because cooperatives were created to remedy the absence of the state in providing this service, they needed to acquire material and discursive control over their waterscape. This control is exercised through its material construction and defence; for example, through wells construction and member participation in communitarian works. Furthermore, the cooperatives also exercise discursive control over the waterscape by creating an imagined hydro-social territory based on their history, which engenders feelings of ownership in the cooperative members. Both of these forms of control need the support of their members, who, therefore, have a central role in the cooperative's ability to influence water governance.

Under the Morales government, the view that the state is responsible for providing water services emerged strongly. However, this position at time conflicts with their acknowledgement of communitarian providers. State policies in Bolivia, and in Cochabamba in particular, aim to reinforce the material presence and control of the state in the water sector. Interviews with state officials highlighted that they see the waterscape of the conurbation as disordered, also due to a lack of official data, and most of their policies can be interpreted as an attempt to order and control it. One such policy is the registration of communitarian providers; another is the construction of large-scale water and sewage infrastructures that reinforce their material control.

This strengthening of the role of the state has created tension with the cooperatives, especially at the municipal authority level. It reflects a fundamental discussion that emerged in the conurbation regarding the scale at which water provision should be carried out. Representatives of municipal providers often defended the view that providing the service is their legitimate role. However, interviews with staff at different levels of the state revealed that their views on the role of communitarian providers are not homogeneous.

Cooperatives employed two main strategies to exercise power at the conurbation level. One was the establishment of relationships with different levels of the state through their umbrella organization (FECOAPAC). One of the main aims of this strategy was for the cooperatives to be considered as legitimate recipients of state resources. Another strategy was through the presentation and implementation of alternative, small-scale models for solving the water and sanitation issues of the conurbation.

Contribution to knowledge

This dissertation offers a contribution to the body of work analysing multiple actors in water governance. The influence of grassroots associations in urban governance has been considered in the literature (e.g., Appadurai 2001, p. 35), and the capability of rural indigenous organizations to influence water governance has also been explored, especially concerning the Andean region (Boelens et al., 2015; Bridge and Perreault, 2009, p. 487). Studies of 'informal' providers in urban areas and their interactions with formal ones have also been carried out (e.g., Ahlers et al., 2014; Bakker, 2008; Cheng, 2014; Marston, 2014; McMillan et al., 2014; Schwartz et al., 2015). However, in-depth studies of how communitarian providers can influence and exercise power over urban water governance are rare.

This dissertation contributes to this body of work by analysing ways in which communitarian organizations can exercise power over water governance in urban areas. First, I explore the importance of the material and discursive control that the cooperatives exercise over the waterscape and conclude that the control that they exercise over their material waterscape is fundamental for their capability to exercise power in front of the state and other organizations. Second, I look at the basis of their control. I argue that the way in which the cooperative members see the waterscape (i.e., as a result of their history and of their sacrifices) is fundamental for the cooperatives' ability to exercise power. Third, I argue that the development of a discourse over their ability to offer an alternative to large-scale providers is fundamental for formulating a contrast to state discourses.

To investigate these issues, I furthermore modified the TPSN framework to include the waterscape and hydro-social territories. This modification contributes to the set of frameworks of analyses in the context of urban water governance, especially where providers acting at different levels are present. This allows me to connect different imaginaries and conceptions of the waterscape (analysed through the hydro-social territories) with governance at a higher scale. For example, it allowed me to connect the feeling of ownership over the waterscape on the part of the members of the cooperatives with their cooperative discursive defence of an alternative model for water governance. This feeling of ownership has also led to their subsequent resistance to state policies, as well as clarifying their power to do so.

Finally, this dissertation contributes to the literature on democratic water governance. It posits that democratic governance is based on the capability of the inhabitants to shape the city. This right is often exercised within small-scale territories, where communitarian organizations are capable of shaping their neighbourhoods. However, this dissertation emphasizes that the capability of the citizens to debate and contribute over the shape water provision should take at the conurbation level is severely curtailed. The capability of the cooperatives to shape networks and participate in influencing water governance at the conurbation level, can then be interpreted as contributing to the democratization of governance in the conurbation.

Overview of chapters

The first chapter establishes how water governance is defined in this dissertation and illustrates the theoretical framework I use to analyse Cochabamba water governance. After explaining why the concept of scale does not allow a detailed examination of the historical/geographical grounding of communitarian organizations, I then introduce the concept of waterscape and hydro-social territories. I argue for their usefulness in connecting discourses over water provision with its material base. I next connect the concept of scale with that of the waterscape, hydro-social territory and networks, by modifying the TPSN framework of Jessop et al. (2008). Lastly, I ground this dissertation in the wider literature on urban water governance, communitarian water provision, and democratic water governance.

The second chapter analyses the history of the Cochabamba conurbation. Focusing on the development of its waterscape enables me to underline how communitarian providers and state provision were co-produced in the valley. Understanding the history of the conurbation is fundamental to understanding how water rights, water provisions and state control were created there. The transformation of land and water ownership in the valley through state legislation still contributes to today's distribution of water rights. The disordered growth of the conurbation led to a reduced state control over peri-urban areas and to the formation of communitarian organizations. The state's attempt to retake control of such areas through policies aimed at making them part of its apparatus is still the basis for the relationship between it and urban neighbourhoods. Finally, I examine how the policies of the Morales government shape water governance in the conurbation today.

Chapter 3 explores the methodology I used during my fieldwork and how I analysed the data I obtained. This chapter explains the reasons for using a multi-scale, multi-space and mixed-methods research design. Such designs included in-depth case studies of two cooperatives, interviews with representatives of cooperatives and interviews with state officials at different levels. I then describe some of the ethical issues I negotiated during my fieldwork and reflect on how my positionality may have affected data collection. I lastly describe how the data were analysed.

Chapter 4 focuses on the cooperatives of the Cochabamba conurbation and on my two case studies. I examine why the cooperatives were established and how their history influences how they are embedded in the conurbation waterscape. I then analyse how the cooperatives established their control over their area of service and water sources and look at the different forms this control takes. I then focus on the relationship between the cooperatives and their members and discuss its importance for maintaining control over the waterscape.

Chapter 5 focuses on the role of the state in urban water governance. I analyse how state officials see the conurbation, stressing that the lack of control over certain areas of the conurbation is correlated with their lack of knowledge of it. I explore how legislative and political changes, as well as infrastructural projects, influenced the waterscape of the conurbation. I pinpoint differences in how various levels of the state see the cooperatives.

Chapter 6 analyses the interaction between the state and the cooperatives. I focus here on the question of ‘scale’ and on how, both discursively and materially, the state is pushing for water governance to be carried out at the level of the municipality or of the conurbation. I then underline how the cooperatives resist this discourse or attempt to adapt to it (such as by forming networks to present their requests to different levels of the state or by creating alternatives to large-scale infrastructural projects).

The conclusion analyses how the preceding chapters contribute to answering the research question, presents the key findings of this dissertation and underlines some limitations and possible areas for future research. I then focus on outlining how this dissertation contributes to knowledge both analytically and empirically.

1. Connecting urban water governance and communitarian organizations

Introduction

The aim of this chapter is to illustrate the theoretical framework through which I can answer my research question. To this end, this chapter is a theoretical point of view to the exploration of how water cooperatives affects the wider water governance of the conurbation. Furthermore, it expands on the existing literature on urban water governance, connecting it to my developments.

In the first section of this chapter, I outline my definition of water governance. This definition presents governance as a deeply political process, influenced by different actors, acting at different scales and with different values and objectives.

The second section outlines a framework which allows me to analyse these different facets of governance. I first look at the concept of scale that is often used to analyse the way in which place-based organizations relate to the state. However, scale alone does not offer sufficient scope for the analysis of the historical-geographical grounding of communitarian organizations. To analyse how both cooperatives and the state control, build, and look at their territory, I then introduce the concept of waterscape and hydro-social territories. These concepts allow me to understand different facets of Cochabamba governance. However, I need to understand how they interact with each other.

To elaborate a framework that allows me to analyse the interaction between different facets of governance, I adapt Jessop et al.'s (2008) TPSN (Territory-Place-Space-Network) framework. This framework analyses the 'mutually constitutive, and spatially intertwined dimensions of socio-spatial relations' (Jessop et al., 2008, p. 389). However, in its original

form it does not include the material landscape. To this end, I include the concepts of hydro-social territory and waterscape.

The third section of the chapter grounds my research within the current debate on the role of communitarian organizations in water governance. Firstly, I place this thesis in the wider range of debates and policies concerning water provision through communitarian organizations in the Urban South. I focus on the debate about the capability of communitarian organizations to exercise agency and to influence water governance. I underline how my research contributes to this debate. Lastly, I consider how the participation of communitarian organizations in shaping their neighbourhoods and wider processes of governance, can be considered as a way in which marginal communities exercise their 'right to the city'.

1.1. Water Governance: a definition

In this thesis, I define water governance as the result of the interactions between different actors, at different scale, with different values and political visions. These interactions determine how water is distributed, to whom, by whom and for what reasons. Water governance, therefore, 'should not be understood as a monolithic or homogeneous set of policies and practices, as competing institutional arrangements and values may coexist or compete' (Perreault, 2008, p. 839).

This definition of governance draws on critical scholarship which argues that environmental governance should be looked at as a deeply political process shaped by different actors seeking to realize different political projects (Castro, 2007a, p. 102). As a consequence, an analysis of governance should include:

> a range of formal and informal institutions, social groups, processes, interactions, and traditions, all of which influence how power is exercised, how public decisions are taken, how citizens become engaged or disaffected, and who gains legitimacy and influence (Reed and Bruyneel, 2010, p. 647).

The notion of power, and in whose interest is exercised, is central to my analysis of water governance. Governance is shaped by 'relationships of power, divergence and conflict' (Bridge and Perreault, 2009, p. 491). Governance, as a result, 'reflects and embodies dominant interests and positions' (Budds and Hinojosa, 2012, p. 122), and continuously changes. As it can be more clearly seen in the South of the World, power is central to the analysis of the process of urbanization of water, as water is considered to be a conduit through which society and power relations are produced, shaped, and reproduced (Loftus, 2009, p. 594).

As a result of such power relations, an analysis of water governance should not only include the distributions and control of material resources, but also of values and worldviews. Power, therefore, should be analysed in all its facets: as material or discursive, economic, political, and cultural (Heynen et al., 2006, p. 12). Castro (2007a, p. 106), in fact, argues that:

> The core of governance has to do with determining what ends and values should be chosen and the means by which those ends and values should be pursued, i.e. the direction of the social unit, e.g. society, community or organization.

While having material direct power over resources is important, the conception of how society should be organized must also be included in the analysis. I take into consideration both material and discursive aspects of power in the present work. This is because the clashes between the different ways in which communitarian organizations and the state see their respective roles and the conception they have of their territory are fundamental to understand their interactions. Furthermore, the way in which they perceive and think about water provision influences and is influenced by their power to materially modify the water infrastructure and distribution. How these two forms of power are conceptualized in this thesis is described in Section 1.2.

How power is obtained and exercised in water governance should be considered looking at different scales. Water and power act at different, but complementary levels: from large scale infrastructures to more intimate spaces, such as the home (Loftus, 2009, p. 959). My work underlines the need to connect power created through relationships between members and

cooperatives to the cooperatives' power to exercise or resist control over the territory at different scales.

Therefore, one needs to take into consideration all kinds of actors and institutions, as well as analysing the values and visions that support and motivate them. One must also take into account which actors are reinforced or weakened, not only materially, but also discursively, through specific policies. To analyse water governance in Cochabamba, I need to explore the differing visions that the cooperatives and the state have over their territory as well as how their policies materially influence it. Furthermore, cooperatives and the state operate at different scales. Therefore, one needs to analyse how scale influences their relative power to modify, materially and discursively, water governance. How all these elements can be considered together is analysed in the next section.

1.2. Space, scale, nature, and actors

This section focuses on building an analytical framework to analyse how Cochabamba's cooperatives influence water governance. I, therefore, need to explore the different facets of water governance in Cochabamba and to explain how these different facets are correlated. To that end, I build a framework of analysis which enhances the TPSN (Territory, Place, Scale, Network) framework of Jessop et al. (2008).

I first explore the concept of scale, underlining its useful aspects and its weaknesses. Two strands of literature are particularly useful. The first concerns how the concept of scale is used to analyse the ways in which local organizations connect with actors at larger geographical scales. The second revolves around the politics of scale, that is, the way in which scale is established. The concept of scale, however, does not allow for sufficient attention to be paid to the relationship between communities and their territory, and to the material elements that influence water governance. To compensate for the limitations of the concept of scale, I introduce the concepts of waterscape and hydro-social territory, which offer the necessary tools to examine how society, power, institutions, and the material territory (e.g. water infrastructure, water sources) are co-produced, and to examine both the material and discursive effects of their interactions.

Lastly, I bring forth a framework of analysis that encompasses these concepts, namely an enhanced TPSN framework (Jessop et al. 2008), which posits that different socio-spatial dimensions (such as territory, place, scale, network and possibly others) are 'closely intertwined'. To adapt this framework specifically to the analysis of water governance, I introduce the concept of hydro-social territory and waterscape and apply them in relation to the concepts of scale and network.

1.2.1. Scale and politics of scale, a fundamental but limited concept

As it has been stated, scale is fundamental to understanding water governance for several reasons. First, scale provides a framework to analyse the way in which social actors are able to operate at different levels (Budds and Hinojosa, 2012, p. 123). This is crucial to understand the way in which communitarian providers can influence governance at higher scales. Second, political ecology scholarship posits that scale is a contested socio-political construct (Norman et al., 2012, pp. 53–55) that was developed to 'justify certain perspectives, and/or reconfigure power and authority' (Budds and Hinojosa, 2012, p. 123). In Cochabamba, analysing discourses concerning the scale at which certain services should be provided is fundamental to understanding the tensions between the state and communitarian providers. Understanding that scale is created, but that it has significant consequences for actors in the conurbation, offers scope to analyse such debates.

The relationship between Cochabamba's local cooperatives and the state involves interactions at very different scales. It is therefore important to analyse how the concept of scale has been used to explore how such interactions take place. The literature on scale has considered the way in which local organizations can exercise real influence beyond the very local scale. The concept of jumping-scale was introduced to describe the ways in which local actors may bypass scalar hierarchies to form alliances with actors operating at a higher scales (such as international networks) (Marston, 2014, p. 74). However, the concept of jumping scale is contested as too restrictive and as sharply dividing the local from the global, while affording little capability for agency to local organizations (Marston, 2014, p. 74).

Marston (2014), in her analysis of Cochabamba water committees, suggests linking the theory of scale to informal urban theory. She focuses on Roy's (2005, p. 154) work on urban informality, which argues that more attention needs to be paid to the way in which local actors strategically engage 'with multiple sovereignties' (that is, in this context: multiple authorities) at different scales. Conceptualising scalar interactions as interactions with 'multiple sovereignties' is a useful way of looking at how cooperatives interact with the state. In Cochabamba, cooperatives often interact with different agencies and state-institutions based on what they hope to obtain and through the links that they have been able to establish. Depending on the issue at hand, the scale at which these actors operate is more or less significant (e.g. when looking for funding the scale at which the financing body operates is not particularly important).

The interaction of cooperatives with state agencies and other organizations then takes place in multiple arenas (Budds and Hinojosa, 2012, p. 123), through interaction with different 'sovereigns' (Marston, 2014), at different scales and for different reasons. This way to look at how communitarian providers influence governance at higher scales, therefore, encourages an analysis of different reasons and strategies to understand why such influence might be necessary.

So far, I have considered scale as the 'arena' in which cooperatives operate, but scale and more precisely the establishment of different scales, is also a political objective (Budds and Hinojosa, 2012, p. 123). This conception of scale is important, in order to understand water governance in Cochabamba. Currently, the debate on how (and by whom) the water service should be provided is heavily influenced by 'politics of scale', namely disputes on the appropriate scale at which water and wastewater should be managed. While scale itself is a social construct built through scalar politics, it has an important impact on water governance and in the capability of communities to exercise agency. This point is underlined in the literature on scale, which stresses that 'scale is both fluid and fixed' (Born and Purcell, 2006, p. 197). This means that when a scale is defined it has a real influence on how power is distributed, but its definition is a result of political interactions. In Cochabamba, scale has a real impact on water users and communities, and assumptions over the appropriate scale of water governance have a direct consequence on how the cooperatives relate with the state.

Looking at scale as socially produced also uncovers the mechanisms of power that influence the choice of the scale at which water governance is supposed to take place. The political meaning of this debate is often obscured by technocratic reasoning. Difficulties in contesting assumptions about the 'proper' scale of service provision and even in presenting it as a legitimate debate, is one of the themes of my research. This is common, as often debates about the scale of water governance lead to the reification of scale. Analysing how scale is politically constituted allows us to challenge it. Normal et al. (2012), emphasize the importance of linking the study of water governance with the politics of scale, thus paying more attention to how scale is created and changed based on power relationships and on who is included or excluded in these processes. In this way, the neutrality of scale is challenged, and what are presented as 'neutral' technical choices can often be subjected to political discussions.

Scale is a fundamental concept in order to examine how water governance is structured and how actors' interactions shape it. However, scale presents some analytical weaknesses. One of the main problems posed, is that the concept of scale does not allow enough attention to the profound relations between actors and territory. Scale is not sufficient to analyse the role of communitarian organizations in water governance, as their power is based on their relation to their territory, their users and their history (as it is examined in Chapter 4). In other words, it is impossible to look at the 'scalar politics' of communitarian organizations without taking into account the deep connections they have with their neighbourhoods, land, water resources, and the discourses they use to legitimize their role as providers. For this reason, the concept of scale should be enhanced through the addition of other socio-spatial dimensions. Two of the concepts that I argue should be used are those of hydro-social territory and waterscape, which I present in the following section.

1.2.2. Hydro-social territories and waterscape

The concept of hydro-social territory and of waterscape connect water, territory, actors and institutions. In this way, I tackle the limitations of the concept of scale explored in the preceding section. To answer my research question, in fact, I need to connect social processes and relations with their material base, that is, water infrastructures, water sources and, more generally, the landscape of the Cochabamba conurbation. It is not possible to

examine the cooperatives without looking at how they modify and reproduce their waterscape, and how their organizations are influenced by the material landscape. At the same time, it is not possible to look at state policies without looking at, for example, the material large-scale infrastructures that they are building, and at the material and discursive consequences that such building engenders.

Both the concepts of waterscape and of hydro-social territory derive from the Political Ecology school of thought, which seeks to transcend the nature/culture binary (Heynen et al., 2006, p. 5), underlining the co-determination of environmental and social changes (Heynen et al., 2006, p. 11). Following such reasoning, it is imperative to introduce territory, water, and infrastructures in my analysis, while at the same time underlining how these elements should not be analysed as a 'neutral' background to water governance. With such an addition, I am able to analyse the deep material and discursive relationships that communitarian organizations have with their territory.

The political ecology school of thought has used various terms to explain the way in which water, society, and power interact with the material landscape, and the material and discursive effects that these interactions produce. To analyse water governance in Cochabamba, the concepts of waterscape and hydro-social territories are particularly useful. These two concepts provide a framework through which I examine both the combination of material territory, actors, and institutions (waterscape) that participate in water governance and the discourses and imaginaries (hydro-social territories) that influence the choices of certain governance configurations over others. These two concepts should 'be viewed as complementary and even mutually reinforcing' (Karpouzoglou and Vij, 2017, p. 2), even if they might, at times, overlap. To expand on those two concepts, the remainder of the sub-section will more clearly explore how I define them and how I intend to use them to analyse Cochabamba's water governance.

The waterscape is the result of the ever-changing interactions between society and water, that take place at different scales, in different times, and are influenced by power. The waterscape allows for an analysis of the connection between water, power and governance (Norman et al., 2012, p. 55), and more specifically, of the way in which unequal power

relations influence (and are influenced by) the way water is distributed in different spaces and at different times (Karpouzoglou and Vij, 2017, p. 2).

The flexibility of the concept of waterscape enables one to pay attention to 'the geographical situatedness' of socio-natural relations and give space for 'detailed empirical observation'. As it is not linked to a specific scale of analysis, it can be used to study issues at any scale. In fact, it is possible to see a multiplicity of waterscapes within the city (Karpouzoglou and Vij, 2017, pp. 2–4). It therefore, enables the study of the interaction between self-managed, non-centralized water providers and municipal water providers working at different scales. Furthermore, the concept of waterscape makes the study of different meanings and institutions that shape water governance, water provision and social identities (Karpouzoglou and Vij, 2017, p. 3) possible. This flexibility is of particular importance in Bolivia where 'water governance (…) is comprised of a patchwork of institutional arrangements, norms and traditional uses, legal grey areas and sector specific politics' (Perreault, 2014, p. 242).

One of the major themes of this dissertation is the importance of physical infrastructures, of the control of the landscape, and how these relate with the history and the institutions of water cooperatives. Therefore, in this dissertation, I use the concept of waterscape mainly to analyse the way in which the landscape and society (to say water sources, the land, infrastructures on one hand and actors and institutions on the other) co-create each other, paying attention to how relationships of power are inscribed in these relations and in the land itself, through laws, property, infrastructures, and the geographically unequal distribution of services and resources.

However, the concept of waterscape is not the only one used to analyse the water-human-landscape-power interactions. The second concept I use in this dissertation is that of hydro-social territory. Hydro-social territory is defined as:

> the contested imaginary and socio-environmental materialization of a spatially bound multi-scalar network in which humans, waterflows, 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 et al., 2016, p. 3).

The concept of hydro-social territory is of particular interest, because it enables one to see how water spaces are represented by different groups. This concept focuses on the co-existence of overlapping imagined territories, sustained by different regimes, imaginaries, knowledges and technologies. Certain hydro-social territories are dominant over others (Hommes et al., 2016, p. 18; Karpouzoglou and Vij, 2017, p. 2). The 'dominant' one is usually created and imagined by the state and is often connected with ideas of progress and modernity. This concept of hydro-social territory allows for an analysis of how the state aims to make local territories 'comprehensible' and discipline local communities, by selecting which territories and systems of knowledges are acceptable and which ones should be eliminated (Boelens et al., 2016, p. 6; Hommes et al., 2016, p. 11; Hoogesteger et al., 2016, p. 94). Most policies currently pursued by the Bolivian state in the Cochabamba conurbation seem to share the aim of making the waterscape more ordered and controllable. An example of this, is the registration of communitarian providers (explored in Chapter 5). Therefore, how the state interprets the hydro-social territory has a strong impact on its relationship with communitarian providers.

Furthermore, the concept of hydro-social territories can be used to analyse conflicts and/or coexistence between overlapping territories, 'territories of territories' built over the same material base but given different meanings by different actors and discourses (Boelens et al., 2016; Hoogesteger et al., 2016, p. 5). In the present thesis, I use this concept mainly to understand how different actors 'see' the waterscape, and how such conceptions influence and are influenced by the material and institutional waterscape. The usage of this concept leads to an analysis of how communities and the state cooperate or clash, not only at the material but also at the discursive level. How the cooperatives see and represent themselves and their territory, and how they see the state, is connected to their history and their sense of ownership over the waterscape. This sense of ownership is the base of their capability to put forth their own imagined hydro-social territory, to say the way in which they imagine an ideal waterscape in the conurbation. Their ability to do so is one of the ways in which cooperatives influence water governance (as it is argued in Chapter 4).

1.2.3. Putting together hydro-social territories, waterscape, scale and network.

In this section, I introduce a framework that puts the concept of waterscape, hydro-social territories, scale and networks in connection with each other. To do this, I extend the TPSN framework of Jessop et al. (2008), which brings four different socio-spatial dimensions (Territory, Place, Scale and Network) to the foreground. I adapt this framework to the analysis of water governance by substituting the dimensions of territory and place with waterscape and hydro-social territory. This allows me to connect the spatial analysis of the TPSN framework with the analysis of the co-creation between society and the physical landscape of political ecology. Finally, I describe how this framework can help me analyse different facets of the Cochabamba water governance.

The concepts of waterscape, hydro-social territory and scale were examined in the preceding sections. Furthermore, I introduce the concept of network which represents a fundamental strategy through which communitarian organizations exercise power over the waterscape at different scales. For example, water cooperatives created a federation, which allows them to defend themselves more effectively when dealing with the state. The study of networks is therefore important to understand the way in which communitarian organizations influence governance. Networks (formal and informal) are used in two different ways. Firstly, they can be used by communitarian organizations to enhance their capacity to shape the discourse on water and governance arrangements, and, more generally, their capability to interact with the state and to defend their waterscape. Networks can then be used to propagate ideas over the hydro-social territory of communitarian organizations at different scales (Hoogesteger et al., 2016) and give them a better capability to resist and present requests to the state. Secondly, informal networks that develop through the lived history of the cooperatives and their struggle to build their waterscape are fundamental to build a communal vision over the cooperatives, which, I argue, are the basis of their capability to control their waterscape. As Boelens et al. (Boelens et al., 2016, pp. 4–5) argue, mutual cooperation and mobilization for the defence of the territory form the basis of rural communities' control over their water systems (Boelens et al., 2016, pp. 4–5). I argue that this observation is also valid for urban communities.

Even though all these concepts are useful on their own, one needs to understand how they relate to each other in order to analyse how water governance in Cochabamba is shaped. Each of these concepts allows for the study of the different ways in which actors can exercise power over the waterscape, but I also need to understand how these different ways of exercising power are correlated. For example, I need to analyse how different groups conceive the waterscape, to say how they create different hydro-social territories. I also need, however, to analyse how these conceptions influence and are influenced by institutional and material changes in the waterscape.

The necessity to connect different 'socio-spatial dimensions' is also underlined by Jessop et al (2008). They presented a framework which connects four different 'dimensions': Territory, Place, Scale and Network. Jessop et al. argue that these dimensions are theoretically and empirically 'intertwined', (Jessop et al., 2008, p. 390), 'mutually constituted, and spatially interweaved' (Jessop et al., 2008, p. 389). This framework is particularly useful for the examination of 'material interactions among different structures and strategies that draw upon these principles of socio-spatial organization in differential, historically, and geographically specific ways' (Jessop et al., 2008, p. 394). The TPSN framework 'is particularly suitable to capture who gains and who loses, where and in what socio-spatial form of water governance' (Beveridge et al., 2017, p. 28) and to pinpoint the 'built-in tension' (Beveridge et al., 2017, p. 33) engendered by the challenge posed to the 'territorial competence of an urban municipal water utility (...) by a decentralized system approach' (Beveridge et al., 2017, p. 30), a tension that is central to Cochabamba's water governance.

However, in order to analyse water governance, I argue that I need to enhance this framework, by adding the dimensions of waterscape and hydro-social territory to be able to ground my research in the material landscape without losing sight of social interactions. Jessop et al. (Jessop et al., 2008, p. 392) themselves suggest that the dimension of nature/environment could be added to the framework. However, the interplay between the available natural resources and social interactions (Heynen et al., 2006, p. 5) implies that one must look at cities as co-created by deeply political socio-natural processes (Gandy, 2004, p. 364; Swyngedouw, 2006, p. 114). 'Nature' therefore, cannot be considered on its own, as it cannot be analysed without a social component, and the results of such socio-natural processes should be analysed as a whole. The hydro-social territory and the

waterscape allows me to analyse different facets of the results of such socio-natural processes. These two concepts therefore allow introducing material elements in my analysis, while putting them in relations with social and political processes.

I also made the decision not to include in the framework the dimension of place and territory. These two concepts, in fact allows one to understand the way in which space is patterned, bordered, and given meaning. The concept of waterscape and hydro-social territory, however, also allows me to analyse how space is modified, shaped and conceived, but furthermore allows me to understand how such actions are connected with the physical landscape, and specifically with water. In this way, this analysis becomes more meaningful when speaking about the governance of water, as it allows to take into consideration both the material, social and spatial elements that contribute to create water governance. For example, the concept of territory allows the examination of what is considered as 'inside or outside' (Jessop et al., 2008). Using the concept of hydro-social territory, I can specifically analyse what spaces are considered (or imagined) as 'belonging' to a cooperative, and why, and how these conceptions are connected to physical elements such as water sources and water infrastructures.

In the following table, I present my framework and how it allows to examine different facets of water governance. The interactions considered in the table help me answer my research questions, as it is explained further down. The table is a modification of the framework produced by Jessop et al. (2008). As in the table presented in Jessop et al, (2008) paper, I present the dimensions of socio-spatial interactions as both a structuring principle, and as field of operation (Jessop et al., 2008, p. 393). A clear example of that distinction can be found by examining the concept of scale. As it is mentioned in Section 1.2.1, scale can be considered as both the arena in which the cooperatives operate and as structuring principles through which different scales are defined (e.g. the territorial levels of the state, such as the municipality, region, and national state).

STRUCTURING PRINCIPLES	FIELD OF OPERATIONS			
	WATERSCAPE	**HYDRO-SOCIAL TERRITORIES**	**SCALE**	**NETWORK**
WATERSCAPE	Creation of waterscape(s)	Influence of the existence of different waterscapes on the hydro-social territories (e.g. seeing the waterscape as disordered)	Waterscape as constituted by interlocking waterscapes at different levels	Necessity to establish networks to defend a waterscape
HYDRO-SOCIAL TERRITORIES	Discourses connected with the construction of waterscapes (e.g. sense of ownership on the waterscape)	Creation of hydro- social territories	Connection between hydro-social territories and scale (e.g. at what scale governance should be carried out)	How networks influence hydro-social territories

SCALE	Building of waterscape at different scales (e.g. building large-scale infrastructures)	How hydro-social territories are structured at different scale	Creation of different scales	Networks structured at different scales
NETWORK	How networks influence the structure of the waterscape	Networks created due to shared hydro-social territories	How cooperatives connected to sovereignties at different scales	Reasons for the creation of a network

Table 1: Author's modification of Jessop et al. (2008) table.

I use the various interactions between the dimensions of waterscape and hydro-social territory to explore how the state and the cooperatives protect and further their role as providers (my first and second research questions, as presented in the introduction to this thesis). For example, the common experiences that derive from the construction of the waterscape of cooperatives create a shared hydro-social territory. That is, the members of a cooperative participate through their work and monetary contributions to the construction of the water infrastructures. Such efforts create a communal sense of ownership over the cooperative, which leads to a shared view of the cooperative. The connection can be then extended further: the hydro-social territory reinforces the discursive control of the cooperatives over the waterscape and influences the material construction of the waterscape. That is, the shared view of the cooperative can influence the way in which their members are ready to support it by, for example, improving it materially.

On the other hand, by analysing the role of the state, I can understand how the existence of differently positioned waterscapes in the conurbation is the reason why the hydro-social territory is conceived as disordered. This conception influences decisions which modify the

waterscape of the conurbation. To say: state officials often look at the waterscape as disordered due to the existence of communitarian providers over which they have little knowledge and control. This pushes forward certain policies aimed at controlling such organizations. Connecting the waterscape and the hydro-social territory, I can therefore understand both the reasons and the effects of state decisions, and how such decisions affect both the material waterscape and the way in which such waterscape is imagined. This allows me to understand, more specifically, how the existence of the cooperatives influence and is influenced by state policies.

Looking at the relationship between waterscape and hydro-social territory allows me to analyse the way in which different actors, discourses, and ways of seeing the city interact with the material construction and reconstruction of water infrastructures, and the evolution of water institutions. It allows me to pinpoint tensions and to understand how different actors negotiate them. It therefore allows me to understand how narratives over the city, and its material transformation influence each other and contribute to create water governance.

Examining the interaction between the dimension of scale and the dimensions of waterscape and hydro-social territories helps me analyse how the state and the cooperatives interrelate (my third sub-question). Using this framework, I can analyse interlocking waterscapes posed at different scales and how discourses connected to the politics of scale are influenced by the way in which the waterscape is structured and imagined. Equally, I am able to analyse how discourses on scale can influence state politics. For example, I can examine how the state presents large scale infrastructural works as the only possible solution to Cochabamba's water difficulties, and what the consequences of these infrastructures are on the waterscape of the cooperative.

The dimension of network, and its interactions with the other three dimensions allows me to analyse how cooperatives create networks to improve their control over the waterscape, to strengthen their hydro-social territories, and to build relationships with different levels of the state. This analysis also helps me to answer my third sub-question. An example is the creation of a federation of cooperatives, which aims to reinforce the role of the cooperatives in the eyes of the state.

In sum, this framework allows for the study of the different material and discursive ways in which cooperatives exercise power. In this work, I define material power mainly as the capability to influence the waterscape, and discursive power as the capability to influence hydro-social territories. With this framework, I examine how different forms of power can be considered as co-produced. Looking at the dimensions of networks and scale, furthermore, I analyse how cooperatives can exercise material and discursive power at the scale of the conurbation.

1.3. Water governance as a political and academic debate

This section grounds my research within the current debate on the role of communitarian organizations in urban water governance, focusing on the South of the World. Such a perspective is important, as Bolivian state and international actors have influenced water governance by establishing an 'optimal' point of view, for example – as will be discussed in Chapter 2 – during the Water War. Furthermore, the perspective of the different actors, such as the state, is influenced by international trends. Finally, I pinpoint my contribution to the literature within that context.

In the first subsection, I introduce the international trends that have led to the present focus on multi-stakeholder governance and on small-scale providers. In the second subsection, I shift the focus to the debate on the capability of communitarian organizations to influence governance arrangements and underline my contribution to such debate. Finally, in the third subsection, I introduce the debate on what can be defined as democratic water governance, presenting also my contribution to such discussion. This allows me to place the Cochabamba case in a historical context and to pinpoint how my framework adds to the current debate on the role of communitarian organizations in urban water governance.

1.3.1. The debate in a historical context

As mentioned previously, the view of different actors in Cochabamba were often influenced by international political and academic perspectives. Such points of view influence the

state's understanding of what the optimal policy is for water provision. Additionally, international debates contributed to policy shifts, which for example, led to the Water War in Cochabamba, central to the historical view of several actors.

In this section, I swiftly analyse international trends influencing water governance in the South of the World, which led to the current attention given to multi-stakeholder governance. Discourses on different models of governance are not simply theoretical debates, but are based on historical shifts (Bridge and Perreault, 2009, p. 476). This section analyses how certain discourses on governance are used and how they entered state policies. While certain models and discourses are dominant in different periods of times, they are not exactly or necessarily replicated in Cochabamba. For example, in Cochabamba, the discourse on the need for 'universal' municipal provision, after a period in which the privatization discourse was introduced and rejected, is often dominant amongst state actors. However, these discourses are coupled with recent discourses on multi-stakeholder governance, which varies at different levels of the state.

The building of the first municipal water and sewage networks started in Europe and North America in the late 19th century to deal with environmental degradation and epidemics (Bakker, 2012, p. 618), and to preserve societal cohesion (Gandy, 2004). After World War I, water and sewage networks started to disappear underground in the North of the World, concealing the relationship of power that they embodied. In the North, receiving potable water in the house became a normalized, unquestioned experience (Kaika and Swyngedouw, 2000, pp. 121-122). Around the 1970s, as aging infrastructures burdened state economies, calls for competition created privatization tendencies. Water (as other forms of natural resources) became a new frontier for investment of capital (Swyngedouw et al., 2002, pp. 126-128).

Water and sewage networks in the South of the World developed differently than the ones in the North, often due to disordered processes of urbanization. However, the model of water provision born in the North had strong influence on how networks in the South were seen, discussed and managed. These discourses had, and still have, a strong influence on the Cochabamba conurbation. Plans that were drawn up by the municipality of Cochabamba in the 1950s and 1970s were often influenced by northern examples and planning theories (see:

Goldstein, 2004). The ideal of a universal municipal provision is furthermore often dominant amongst the municipal officials I interviewed in Cochabamba.

Universal access to water and sanitation delivered by a centralized company was, until recently, considered the model to which all cities in the South would eventually conform (Gandy, 2004, p. 368). However, since the 1970s the growth of slums and the decreasing presence of the state led instead to a growing polarization in access to services (Gandy, 2004, p. 372). Those that do not have access to the formal network resort to alternative and often informal ways to access water, such as water trucks, small scale networks and artisanal wells (Allen et al., 2006, p. 334). This is the situation in Cochabamba, where most of the inhabitants receive water from the communitarian water providers (see Chapter 2).

In this context, private provision was presented as a way to bring water 'to the poor' (Castro, 2007b), often as part of structural adjustments supported by the World Bank and the International Monetary Fund (IMF). Between the 1990s and the early 2000s, the privatization of water services became a mainstream policy (Goldman, 2007, p. 788) based on the assumption that the public sector was a locus of corruption and rent-seeking behaviour (Fine and Hall, 2012, p. 51), and inherently inefficient (Swyngedouw, 2005a, pp. 82–83). There is no evidence, however, that private sector participation improves water access, a reality eventually acknowledged by the World Bank (Castro, 2007b, p. 760).

These waves of privatization are important to understand the pushback against them. The Water War in Cochabamba is one of the most famous example of successful resistance against privatization of water. Discourses against water privatization were in evidence in the discourses of state officials, activists, and communitarian leaders I interviewed, some of which recalled actively participating in the protests. Cochabamba's revolt against the privatization of its municipal system during the water war of 2000 had very local reasons (see Chapter 2), but it was also part of a larger movement. Privatisation was contested both locally and by a growing international water justice movement. A wave of high-profile privatization concession contract dissolutions followed the first era of privatization, often due to mass protests (Goldman, 2007, p. 788).

After a sharp rise of private sector participation in Africa, Asia, and Latin America in the 1990s (Bakker, 2013a, p. 254), social and financial problems then brought a 'partial retreat' of privatisation policies in many low-income countries (Bakker, 2010, p. 94). The retreat of international companies from direct management of water service should not be considered as a retreat of privatization *tout court*. Bakker (Bakker, 2013a, p. 257) contends that 'we are witnessing a refinement, rather than a retrenchment, of the neoliberal project'. Private participation takes different forms in different spaces. Private companies started to cherry-pick the most profitable cities, and population sectors (Bakker, 2013a, p. 257) (Swyngedouw, 2005a, p. 95). Companies also started to stipulate public-private partnerships, leaving the public sector in charge of long-term investment (Swyngedouw, 2005a, p. 89). Tri-sector partnerships (involving the civil society) were also brought forward (McDonald and Ruiters, 2012, p. 5) (Loftus, 2009, p. 957), as part of these subtler forms of private capital participation. In Bolivia, 'mixed' (to say public-private) forms of water provisions are allowed by the legislation (see Section 2.5). I did not find concrete examples of public-private agreements in Bolivia. However, the Bolivian academic Carlos Crespo did express preoccupation over the fact that such form of private participation was allowed (Interview 25.02.2014).

It was in this context that interest in communitarian providers, which had long existed, started to strengthen world-wide. This interest involved both proponents of privatization and the anti-privatization front (Bakker, 2008, p. 236). Free-market leaning organizations, in fact, started to demonstrate keen interest in the 'informal' activities of 'the poor' (AlSayyad and Roy, 2003, p. 2). In this context, the recognition of communitarian providers appears to be an attempt to find 'new private sector champions' (Ahlers et al., 2014, p. 3).

However, interest in communitarian organizations as 'alternative to privatization' (McDonald and Ruiters, 2012, p. 10) has also grown in the anti-privatization front. The water sector, in fact, became strongly 'politicized' by privatization attempts which created an 'effective and well-coordinated cluster of regional and international groups that have opposed water privatisation and which are now proposing alternatives' (McDonald and Ruiters, 2012, p. 10). Latin American anti-privatisation activists look at 'communitarian management' as a valid alternative to both the private sector and traditional forms of state provision which are considered 'bureaucratic and centralised' (Spronk et al., 2012, p. 445). Activists in Cochabamba, such as Oscar Olivera (one of the leaders of the Water War), see

communitarian water providers as a cradle of democratic practices, whose influence goes beyond water provision (interview, 11.08.2014). Such stances are often accompanied by disillusionment over the role of the state. Cochabamba activists often have links with international networks, which broadly share these views.

The growing interest in communitarian providers has not assured their survival. Mainstream policy literature often sees informal utilities as temporary measures (as discussed in: Cheng, 2014, p. 2), useful only until the realization of a universal centralised water provider (Kooy, 2014). However, Bakker (2010, pp. 39–41) argues, such a vision does not take into sufficient account the reality of these organizations, whose value to their members is not based simply on their 'efficiency' calculated through an economic model. Attempts to displace 'community knowledge of water supply with the *teche* of hydraulic engineering, accounting, and water economics' are often resisted. In which ways new 'multi-stakeholder' governance agreements prepare or force communitarian organizations to assume institutional forms, decisional and ownership models that would make it easier for them to be subsumed to technocratic (and in certain cases profit-based) forms of governance, needs to be therefore questioned. Further, how communitarian organizations are able to resists such attempts should also be examined.

This is a central debate in Cochabamba, where the growing institutionalization of communitarian water providers are seen with wariness by some water activists, as an attempt of the state to control and co-opt such providers. Furthermore, certain state authorities, particularly the municipal ones, see universal provision by a municipal (or conurbation-wide) provider as the ideal arrangement, while at the same time political discussion over the reason for such a choice are often obfuscated beneath technical, economical, or legal reasoning.

The case of Cochabamba can therefore be connected to wider changes in water governance in the South of the World. At the same time, however, context is fundamental to understand the relationship that develops between communitarian organization and the state is, as will be underlined in the next section.

1.3.2. Can communitarian organizations influence governance?

Whether communitarian organizations can influence governance is central to the academic and political debate on them. One of the key contributions of this thesis is an analysis of how this can happen and where the cooperatives draw their power from. In this section, I present different arguments from the academic community on the communitarian organizations' ability to exercise agency and I compare them with what emerged from my data. This makes clear what are the different perspectives on the subject and how this dissertation contributes to the debate.

The growing attention towards communitarian water providers can be interpreted as a part of a shift to 'multi-stakeholder' governance, described in the previous sub-section, whose later manifestation includes an enhanced attention to 'civil society' participation. In this context, 'governance' is seen as an institutional model that determined how and by whom decisions are taken over a certain process and it does not coincide with the definition given in Section 1.1. Examining this model of multi-stakeholder governance and the role of communitarian organizations in them, the question emerges over the capability of communitarian organizations to exercise agency. Some authors argue that the state can exercise nearly complete control, while others argue that communitarian organizations are able to engender changes. This debate underlines the need to consider the specific context in which communitarian providers operate. I argue that communitarian providers in Cochabamba can exercise agency and I stress how my framework allows me to add new dimensions in understanding the role of communitarian providers in water governance.

The 'water crisis' in cities of the Global South has led to calls for 'good governance' (Perreault, 2014, p. 236). Governance, in this context, is often presented in public policy as an apolitical, neutral, and empowering tool that can be harnessed for the resolution of specific environmental issues (Bridge and Perreault, 2009, p. 477). Governance's supposed neutrality, however, often results in the hiding of political and economic interests (Perreault, 2014, p. 236), a phenomenon that Li (2007) describes as the 'rendering technical' of governance. Castro argues that such kind of urban governance restricts the debate to 'the technologies of management', excluding 'end and values' from the discussion (Castro, 2007a, p. 106). This vision of governance has resonance in Cochabamba, as certain facets of

governance (especially concerning the construction of large-scale infrastructures) are often presented in technical terms by the state, and therefore are difficult to criticise. However, the capability of the state to control the debate in Cochabamba is somehow limited, and the evidence of conflicting visions and values is often clear.

Studies on the subject of 'governance', moreover, often focus on multi-stakeholder neoliberal[2] governance, where state, the private sector, and 'public society' are called to participate. This discussion does not necessarily fully apply to Cochabamba (for debates over the supposed post-neoliberalism of the Bolivian state see: Macdonald and Ruckert, 2009; Marston, 2015; Webber, 2011). Although in Cochabamba private actors are present (for example, those that sell water through water trucks, and building companies), they are not directly called to participate in formal mechanism of governance. The literature on neoliberal governance, however, offers insight to the way in which the state exercises power and to its relationships with communitarian organizations.

Swyngedouw (2005b, p. 1998) argues that pro-poor organizations should be wary of their involvement in multi-stakeholder governance, because they will not have any real agency in it. The state is often central to transfering competence to non-governmental actors, and to setting up the institutions in which actors are invited to participate. As a result, most of these institutions or networks will be controlled 'directly or indirectly' by the state (Swyngedouw, 2005b, pp. 1997–2002). Therefore, Swyngedouw argues, while multi-stakeholder environmental governance is presented as democratic and empowering, in reality, it is often top-down, opaque, and easily manipulated by those in power (Swyngedouw, 2005b, p. 1993). Seen in this perspective, community-participation in urban water governance then risks to become a way to create consensus around authority's objectives (Finewood and Holifield, 2015, p. 89), as well as way for the state (and private organizations) to abandon or underserve part of the population (Bakker, 2013a, p. 257).

[2] While neoliberalism can take different forms (Finewood and Holifield, 2015), political ecology literature broadly defines neoliberal environmental governance as the "institutional realignment away from state-centric (public-sphere) to market-based (private-sphere) forms of governance", that subject the environment to a "neoliberal logic", that favours "market based actors and practices", and is characterized by privatizations, rescaling, and the multiplication of "stakeholders" involved in the management of nature.

However, relationships between formal utilities and community organizations are not always exploitative. The technical water committees in Venezuela are looked at as an example of state-community co-production of the service, that not only improves water provision and management but also fosters the capability of community members to realize wider changes and empowers the community (McMillan et al., 2014). This highlights the importance of context in understanding how empowering (or disempowering) the co-production of services can be (McMillan et al., 2014) and the importance of the political aims of those involved.

This debate then raises a fundamental question: are communitarian organizations capable of participating in and modifying dominant governance regimes or are they inherently subjected to them? In my dissertation, I argue that communitarian organizations can exercise agency, to a limited extent. I also argue that there is a need to look at how state discourses influence the cooperatives. Part of the literature sees the participation of communitarian organizations to service provision as 'self-disciplining' governmentality. 'Governmentality', a concept originally formulated by Foucault (1991), is often used in the literature on urban and environmental governance to explain the capability of the state to control its citizens outside a direct intervention. Governmentality is defined as a technique of governance aimed at disciplining the population (Swyngedouw, 2005b, p. 2003), transforming citizens into 'rational' and 'disciplined' inhabitants of the city. Governmentality is then one way to understand how 'the urban is produced as a governable space' (Gabriel, 2014, p. 41).

Gabriel (2014, p. 41) puts this vision of governance into discussion as he argues that 'governance is too often theorized as a dominating force that inculcates an unwitting and ultimately powerless underclass into the service of purely elite interests,' undermining the capability of different interests to be heard and served by governance regimes. Kooy and Bakker (2008), furthermore, criticise the interpretation of 'governmentality' as a totalizing system, especially when applied in a post-colonial context, where governmentality techniques are often 'contradictory and contested' and simultaneously characterized by oppression and resistance due in part to a very heterogeneous population. I argue that this is the case in Cochabamba, where the power of the state to 'govern' is limited. Case studies on urban governance also contribute to this debate. Appadurai (2001, p. 35) suggests that resistance to neoliberal governance is possible with his analysis of how grassroots associations can influence urban governance. He describes Mumbai slum-dwellers

organizations' capability to produce knowledge about their own communities, and to bring forth proposals to improve their living conditions as 'governmentality from below (…) governmentality turned against itself.'

These debates underline that to examine water governance, it is then necessary to analyse both the discourses of various actors and the material consequences of such discourses. In other words, as argued in the precedent section, to understand who exercises power and in which way in water governance, it is necessary to look both at the influence of different actors on the waterscape and on the hydro-social territory, and to the way in which these two elements influence each other.

The literature on informality also contributes to this debate. Studies on urban informality offer important insights to the contradictory issues of how communitarian organizations might be able to resist state power on the one hand, and how the state is able to extend its influence on organizations theoretically operating beyond its control, on the other. This discussion is fundamental to look at the influence of the state in Cochabamba for two reasons. It underlines how state absence in peri-urban, 'informal' or illegal neighbourhoods can be considered as an active political choice that influence the evolution of communitarian water providers. It furthermore underlines how the way in which the state defines certain areas and actors as formal or informal has a direct consequence on those excluded and can therefore be considered as a way to exercise power. Finally, it offers insight on the limits of such power.

Critical literature looks at informality as produced by the state to exercise control over the population (Ahlers et al., 2014, pp. 4–5). AlSayyad and Roy (2003, p. 5) define urban informality as an 'organizing urban logic', that 'determines the rules of the games', and is based on the 'constant negotiability of value and the unmapping of space'. Studies of informality underline the capability of the state to decide which kind of informality should be nurtured or suppressed (Roy, 2005, pp. 155–156). However, in a similar manner to the discussion of governmentality, a point of debate is the measure in which the state is able control the production of informality. Ahlers et al. criticize Roy (2005) for giving 'hegemonic authority to the state, thereby reifying the state by making it reign supreme over urban space and practices'. This state-centred approach negates the agency of others

underlining that ‘the state facilitates or is complicit in processes of informality, but does not necessarily dominate the process’ (Ahlers et al., 2014, pp. 4–5). Looking at the case of Cochabamba, there are limitations in the capability of the state to control and sanction certain space and practices. However, as the literature suggests, the definition of certain practices and space as illegitimate does have concrete effects on them, for example by excluding them from state funding (see Chapter 5).

Critical urban studies also underline the possibility for marginalized communities to contest urban governance. Perreault (2008, p. 839) argues that:

> If we are to understand the variegated nature of resource governance arrangements (…) greater attention must be paid to the role of civil society actors in responding to, contesting, and shaping particular institutional configurations. Geographical work on resource governance has tended to view state and capital as the privileged sites of governance, paying scant attention to the agency of social movements, resource users' groups, or other civil society organizations

In analysing the capability of communitarian organizations for agency, it needs to be underlined that the capability of communitarian organizations to influence governance arrangements, should not only be analysed by looking at the involvement of communitarian organizations in ‘official’ governance mechanisms, or in direct interaction with the state, but also by looking at discourses and practices that take place outside the state remit. As it is illustrated in Section 1.1, governance is composed of contradictory practices, and contradictory discourses, which contribute to the production of a fragmented waterscape, and differing hydro-social territories. There is a place in water governance, therefore, for discourses from below to impose themselves, and for marginalized actors to be able to intervene in policy designs (Romano, 2016, p. 74). Resistance might take place at different scales, as some practices might have their roots in the everyday life and livelihood claims (Perreault, 2008). More attention should therefore, be paid to ‘the power of self-governance’ and to the ‘micro-politics of subject formations’ and to the ways in which they create knowledges about the city (Gabriel, 2014, pp. 41–42).

My thesis contributes to the debate on the agency of communitarian organizations by focusing specifically on their capability to shape water governance. The framework I outline in Section 1.2.3 allows me to link a conurbation-wide analysis of water governance to the analysis of the cooperatives control over the waterscape. Furthermore, I connect water governance with the way in which the cooperatives see and conceive their waterscape. The present work adds to the literature by underlining the importance of looking at how control over water governance is influenced by the capability of different organizations to exercise control over the waterscape and hydro-social territories in different spaces and at different scales.

1.3.3 Methods of democratic water governance

A side effect of the capability of the cooperatives to exercise governance is that they provide a legitimate method to democratise water governance, the analysis of which is a key contribution of this thesis. This dissertation explores how such democratic elements of water governance manifest themselves in the reality of the cooperatives, as well as how this is viewed by the state. This section expands on the existing literature on the topic and clarifies my definition of democratic water governance.

Problems of water governance usually result in an unequal distribution of water risks and benefits to those with least power (Joy et al., 2014, p. 964). Therefore, the need for democratic governance is stark. The last section underlined how the capability to participate in water governance goes beyond simply receiving and paying for a service, and it includes also the capability to shape the way in which governance is organized. Therefore, an analysis of a just and democratic water governance involves interconnected questions of distributive justice (who receives the benefits and who the disadvantages of water governance), and procedural justice (who participates in water governance, why and how) (Perreault, 2014).

The concept of democratic water governance has been explored by both academic and social movements, through a series of different concepts, mainly the notions of water justice, the right to water, and the right to the city. While these concepts sometimes overlap, they have separate meanings. The right to water (and sanitation) mainly involves the right to access

(Bakker, 2013b). It has been codified in various state laws (e.g. Bolivia, South Africa) and has been recognized as a human right by the General Assembly of the United Nations. The right to water has been used by various social movements to claim the right to water access and to fight privatization. However, Bakker (2007) explains how the right to water does not necessarily protect against privatization, as it only focuses on the right to receive water and not on how it is provided. Furthermore, it is often interpreted as an individual right, and it is usually centred around the duty of the state to provide the service, therefore not necessarily supporting collective rights over water sources that are central to informal/communitarian water provision (Mehta et al., 2014). However, Perreault argues that: 'we would do well to acknowledge the political power of the notion of rights, and the discursive and material potency of rights claims' (2014, p. 240), as protests over the right to water can be the catalyst for movements on broader issues, such as water justice (Sultana and Loftus, 2015).

On the other hand, environmental justice, and water justice specifically, have a broader focus. Environmental justice's core concern is the distribution of environmental goods and ills (Schlosberg, 2004). However, there have been calls for environmental justice to go beyond a distributive concept of justice, to include 'participation in the political processes which create and manage environmental policy' (Schlosberg, 2004, p. 517). Water justice should then involve participation and recognition of communitarian actors as legitimate, and should be placed in a historical, social, cultural, and environmental setting (Joy et al., 2014, p. 964) (Zwarteveen and Boelens, 2014). Boelens et al. (2011) stress how water conflicts do not only involve the right to access, but also to 'culturally organize and politically control water resources', issues that engender conflicts that become even more complicated in multicultural societies.

Democratic governance is then the right to participate in the construction of the governance arrangements themselves. The concept of democratic water governance (intended as a right to share and participate in the management of resources) can then be associated with the right to the city:

> Just as the right to the city, as a complex bundle of rights, is the right to inhabit the city – to the resources and services necessary for dignified life, and to appropriation of the means of production and social reproduction – so too the institutional

> arrangements and spatial scales we employ for governing water must address questions of individual and collective fulfilment, democratization, material relations of production, and ecological sensitivity. (Perreault, 2014, p. 243)

The right to the city is a concept that was first brought forward by Lefebvre (1967),but has been used in more recent times by academics (e.g. Harvey, 2008) and activists alike. The 'right to the city' is intended as a collective right to claim 'shaping power over the process of urbanization (...) in fundamental and radical ways' (Harvey, 2008, p. 272). The right to the city is then a collective right, capable to reconfigure the city as a 'site of struggle' (Perreault, 2014, p. 241). It is not intended only as the right to the present city, but also as the right to a 'future city' and to a 'better system in which the demands can be fully and entirely met' (Marcuse, 2009, p. 193). This interpretation of the right to the city relies on the Lefebvrian conceptualization of the social production of urban space, formulating therefore the right to the city as a right to participate, appropriate and produce urban space (Shillington, 2013, p. 105). Recent readings of the right to the city connect it with the political ecology interpretation of urban space, as created through the social-natural metabolic process (Shillington, 2013, p. 105). Therefore, the right to the city implies a 'right to metabolism' (Heynen et al., 2006, p. 12). The need for the democratization of the urbanization of nature has also been underlined by the Urban Political Ecology literature. Zimmer (2010, p. 349) argues that 'a virulent question in Urban Political Ecology is (...) that of democratic participation in the production of governance of societal relationship with nature'. The democratization of the process of socio-ecological change is considered fundamental, if we are to obtain true urban 'sustainability' (Heynen et al., 2006, p. 13). Therefore we can interpret appeals to the right to water (in its widest sense) as an appeal for the right to participate and benefit from urban metabolism (Shillington, 2013, p. 106).

Therefore, a just and democratic water governance, would include a right to water that is not only intended as the capability to access water, but also the capability to modify and participate in governance arrangements, and to directly shape the city and the waterscape, materially and also in an abstract way. It would also mean the acknowledgement of the legitimacy of actors such as the cooperatives, and of their rights in shaping urban water governance. Connecting this section with the precedent one, a just governance should be the capability of citizens and communities to produce not only their waterscape, and their imagined territories, but also to contribute to define the dominant hydro-social territory. In

other words: citizens should be able to participate on a debate on what should be the ideal configuration of water governance in the city, which actors should be in charge of it and through which mechanisms these decisions should be taken. However, as the right of the citizens can be restricted to that of receiving the service, how the water arrives (or does not arrive) to the tap is treated as a technical and economic issue, and the debate is often not even acknowledged as existing.

In Cochabamba, cooperative members are effectively participating in producing their waterscape, and their imaginaries connected to their waterscape. However, the state also produces discourses over the role of the cooperatives and on its own role, often with contradictory effects. These visions create the conurbation's water governance, but often without an open, political debate about it.

Conclusion

This chapter underlines the need to consider water governance as a deeply political, and conflictive process through which different visions and conceptions of the city, of the service, and of the physical waterscape are brought forward. To understand how the cooperatives influence governance, one needs to go beyond the official channels of state-communitarian actors interactions, to look at informal interactions, and clashes, as well as how the presence of the cooperatives shape the waterscape, and the conception of it.

There is therefore, a need to look at different actors, at different scales, and to connect these with their visions of and relationships with their territory and water sources. To this end, I use the TPSN framework, enriched with the concept of waterscape (at different scales) and of hydro-social territories. This framework allows for the consideration of how cooperatives see their waterscape. On the other hand, I can analyse the role of state authorities in modifying the waterscape through large-scale infrastructures and regulations, while also analysing how state politics is influenced by the assumption that water provision is better carried out at a conurbation level. My thesis contributes to the literature on water governance and the debate on democratic water governance by underlining the connection between

control over the small-scale waterscape and hydro-social territories and the wider governance arrangements of the conurbation.

2. Setting the scene: history and geography of a changing landscape

Introduction

The aim of this chapter is to analyse the history of the Cochabamba conurbation, focusing on water and land use and management. The history of the conurbation allows me to understand how the Cochabamba waterscape was created, as well as the deeply historical processes that contributed to the creation of different imagined hydro-social territories that interact to create Cochabamba's water governance. This chapter, then, places the water cooperatives in an historical, political and geographical context in order to highlight the interconnectedness of water and sanitation governance arrangements in the valleys, and the processes of co-production of both formal and informal water providers. These processes are both inherently local and linked with wider processes. Therefore, while my focus will remain in Cochabamba, it is necessary to examine the deep political changes that characterize the Bolivian political landscape, and the way in which these changes influenced, and were influenced by, the growing urbanizations of the Cochabamba Valley.

The first section will briefly set the scene with an overview of the geographical and climatological conditions in Cochabamba and the current conditions of water service in the conurbation. The second section focuses on the Cochabamba foundation and swiftly growing urbanization process. I go through the foundation of the city, to then focus on how the division of the land and the assignment of water rights, as well as the disordered process of urbanization, created a segregated landscape that negated to a wide part of the population access to fundamental services. I underline how wider changes, such as the Law of Agrarian Reform, influenced, and still influence, water access in the conurbation. This section will then establish how water rights were distributed in the conurbation, and how issues that still characterize the conurbation, such as contrast between the city and the countryside for access to water, land speculations, and large-scale projects first emerged.

The third section examines the neoliberal reform of 1980s-1990s. I focus on the Law of Popular Participation, an example of how a neoliberal reform aimed to re-scale the political process had very ambiguous consequences. This section analyses the construction of urban neighbourhood and communities and how they related to the state. As most cooperatives were founded around this period, this section allows one to understand how the history of the cooperative is inserted in the history of the conurbation, as well as giving a background to the lived history of the cooperatives. Finally, I analyse how water contrasts intensified the strengthening of associations such as the Federation of Irrigators.

The fourth section focuses on the popular revolts of the early 2000s. I focus on the Water War and its causes. I underline how national, international, and local factors contributed to its inception, therefore emphasizing the importance of different scale of analysis when analysing water governance in Cochabamba.

The last section focuses on the changes that took place under the government of Evo Morales. I stress the discussion on the presumed post-neoliberalism of his government, and the tensions and contradictions that characterized it. I then focus on the water legislation and on the effort of the government to order the water sector, while underlining the tensions created by a policy that aims both at strengthening the state role in the water sector and officially acknowledges communitarian water management. Such policies constitute the background of the current relationship between the communitarian water providers and the state in Cochabamba.

2.1. An overview of the Cochabamba waterscape

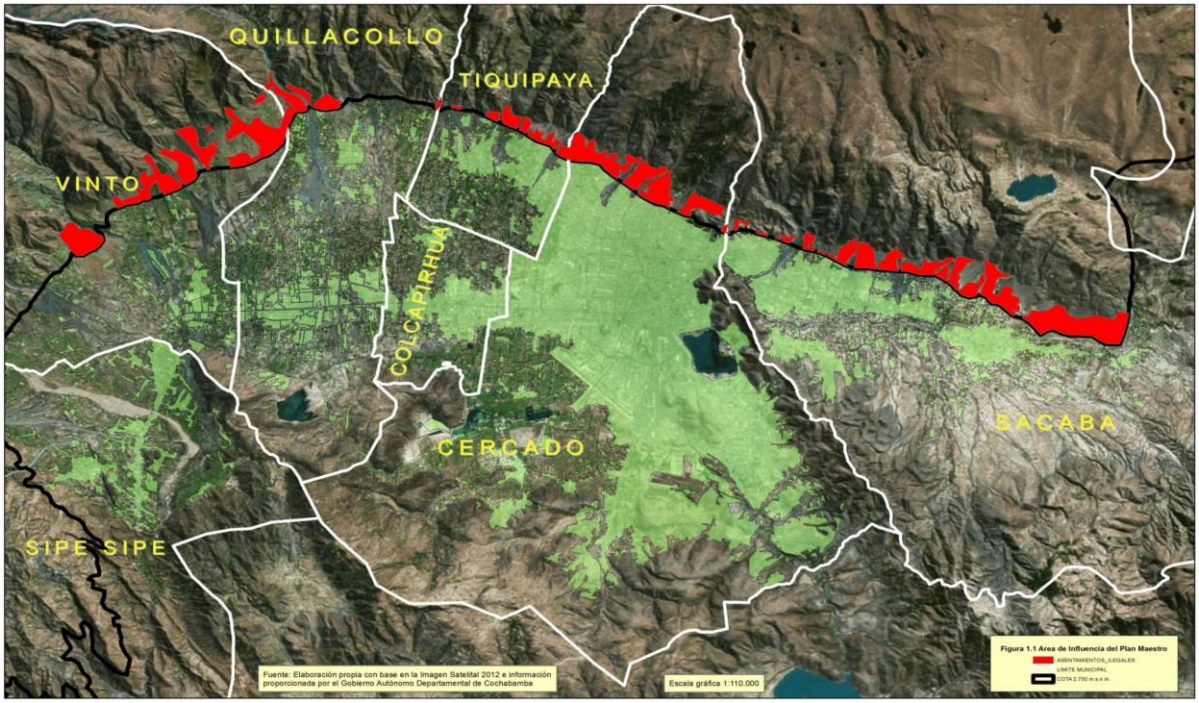

Figure 1: Cochabamba Conurbation. Source: PMMC Diagnostico, 2013. In red the areas where the conurbation has grown outside the allowed altitude for construction.

The shape that the waterscape took in the years, as conurbation growth, agricultural lands, and the physical waterscape were co-created, is of fundamental importance to understand water governance as a whole, as well as the placement and difficulties of communitarian providers within the conurbation. Physical, social, economic and political elements all contributed to shape the current waterscape. The unregulated growth of the conurbation is determining environmental degradation as well as an absence of fundamental services in marginal neighbourhoods. Water scarcity and the growth of urban population increased tensions between rural and urban users. The physical shape of the waterscape, and the differences in the availability of water sources in the conurbation, influenced the socio-economic characteristics of different neighbourhoods. The difficulties to find water in the south of the conurbation, and the relative ease with which water sources can be accessed in the north, influenced the construction of more affluent neighbourhood in the latter areas. At the same time, the continuous growth of the conurbation pushed poorer neighbourhoods in even more marginal areas. All these elements contributed to create a fragmental waterscape in which a variety of self-constructed water providers emerged, whose history and characteristics can be understood only when placed in the wider waterscape of the conurbation.

Cochabamba develops in the Cochabamba valley at an average altitude of 2500m, cradled in the slopes of the mountain range *Tunari* in the north and the San Pedro Mountain in the east. It is the centre of a continuous conurbation that stretches over the Cochabamba and the Sacaba Valley, part of the River Rocha watershed (Ledo, 2013, p. 14). The conurbation (now officially organized in a Metropolitan Region[3]) includes the municipalities of Cochabamba, Sacaba, Quillacollo, Colcapirhua, Tiquipaya, Sipe Sipe end Vinto. In 2012, it hosted 1,141,094 inhabitants[4], a steep growth from the 880,927 of 2001 (INE, 2014).

Cochabamba has a semi-desert climate, with around 70 days of precipitation per year (Ledo, 2013, p. 15) , concentrated in the summer months (November to March). Rain water is collected in the *Tunari* range recharging the valley water sources (Hines Thompson, 2015, p. 13). Water deposits in chains of lagoons built in the mountain stretch from the Incaic period to the 19th century. Such mountain lakes are now used both for agriculture and for urban purposes and are at times an object of tension between different right-holders.

Between 2800 m and 2580 m of altitude, water penetrates the soil recharging the aquifers, and some re-emerge around 2580-2560 m of altitude forming 'water eyes' (Crespo Flores et al., 2004, p. 35). Water sources are therefore mainly placed in the northern part of the conurbation and are especially abundant on the Tunari slopes, but are difficult to find (and of bad quality) in the arid Southern Zone of Cochabamba, where wells often provide saline water (Walnycki, 2013, p. 140), and where the municipal network is limited. It is an everyday occurrence in the affluent Norther Zone to see water tanks filling up in backyard wells, to be sold to unserved areas.

[3] The Metropolitan Region is not necessarily a synonymous with the Cochabamba Conurbation, as is includes both rural and Urban Areas (Ley n 533, 2014, art 4a)
4 Projected at 1,227.,00 in 2015 http://webine.ine.gob.bo/ine/tags-prensa/kanata

Figure 2: Water tanks collecting water in the North Zone

Cochabamba is nevertheless a productive agricultural area. For more than three millennia farmers channelled and controlled water sources (Hines Thompson, 2015, p. 14), building intricate irrigation systems (Hines Thompson, 2015, p. 5). Those that control and maintain water systems for irrigations are called *regantes* (irrigators) and they are organized in a myriad of separate systems in the valley. Since the 1990s, these organizations were federated at a departmental level to defend their water sources and the customary rights that regulate water access (generically defined as *usos y costumbres*).

The long history of water management in the valley created intricate networks of providers and rights. Water sources and irrigation systems are regulated in diverse ways shaped over different historical periods. This resulted in complex systems of very local rights that varies with the water sources, but also with the time of the year (especially during the rain seasons, when water is abundant). Water can be obtained through wells (used by most communitarian systems for potable water), rivers, systems of channels that canalise mountain waters, water

from the mountain lakes, natural springs, or underground filtrations (Crespo Flores et al., 2004, pp. 19–20). While water scarcity and periodical droughts always influenced the valley, conflicts over water control became more intense in the late 19th century as the city started to consume growing amounts of water (Hines Thompson, 2015, p. 1). Conflicts between rural and urban uses of water characterize the valley, as the conurbation keeps expanding in rural areas, and need for water is growing. Conflicts and negotiations with rural providers also involve some cooperatives (see Chapter 4), especially those that could not find sufficient water sources in their area of service.

The conurbation grew quickly and disorderly in the last 50 years. Such growth created a fragmented waterscape and left vast areas outside the reach of municipal services. At the same time, the lack of fundamental services and city planning caused an environmental degradation that put water sources at risk. The conurbation went through a process of horizontal, low density growth, and occupies nine times the territory that it did fifty years ago. In 2012 the yearly consumption of land was of 400 hectares, a growth that is increasingly waterproofing the recharge area of the aquifer (Ledo, 2013, pp. 14–17). Traditional agricultural activities are declining, as the best agricultural land, in the north of the city, is consumed to build both gated communities and precarious settlements (Ledo, 2013, p. 20). The conurbation is now rife with environmental problems, in part due to untreated waste water. The river Rocha, that flows through the conurbation, is now little more than an open-air sewage, especially in the dry season, as the only working large-scale waste water treatment plant, Albarrancho, routinely receives more water than it can treat.

The conurbation unplanned growth resulted in scarce covering of municipal water providers. The largest provider of the conurbation is SEMAPA, a Cochabamba municipality's decentralized institution. Two other municipalities have decentralized providers: Sacaba (EMAPAS) and Quillacollo (EMAPAQ). The Units for Basic Sanitation that operates in the other municipalities mostly provide sewage service. None of these organizations are currently able to provide water (or sanitation) to the whole of the municipal region. SEMAPA serves around 50% of the Cochabamba population (Ledo, 2013, p. 25).

Those not connected to municipal networks, access water in a variety of ways. Some neighbourhoods self-organized in order to build their own water and sanitation systems. The

Cochabamba Metropolitan Masterplan (PMMC, 2013: p. 8-10) estimates that there are between 600 and 700 communitarian water providers in the conurbations. These organizations are governed under different systems, with varying levels of formal recognition, and supply water (more rarely sanitation) to users with varying levels of quality and organization (Zegada et al., 2015, p. 22).

Independent water systems in the conurbation are managed within three main organizational structures: OTBs, water committees (or water associations), and water cooperatives (Lavrilleux & Compère, 2006: 16). OTBs (grassroot territorial organizations) are the official representatives of territorial communities in front of the state. In urban areas, they mainly take the form of officially recognized neighbourhood councils which are in charge of various activities and organizations. Some OTBs directly manage an autonomous water system. In other cases, independent water systems are managed through a water committee or a cooperative. The territory of such organizations and that of the OTBs often, but not always, overlap. The cooperatives Quintanilla, for example, bring the service to multiple OTBs.

Cooperatives are not the most common form of communitarian water provider in the conurbation and are in fact a minority. Cooperatives present some differences from other communitarian organizations in the conurbation. They undergo a stricter control by the state, as they have to follow the guideline posed in the General Law of Cooperatives[5]. Furthermore, members of a cooperative officially acquire a share in the cooperative at the moment in which they obtain a water connection.

Water cooperatives often operate in older, well established neighbourhoods, with good access to water sources. A survey of the conurbation communitarian providers confirm that cooperatives are more likely to be placed in urbanized areas (Lavrilleux & Compère, 2006, p. 21), to be better organized, to bring a better quality service (Lavrilleux &

[5] A new general law of cooperatives was approved during my field work.

Compère, 2006, p. 52) and to serve an higher number of families (Lavrilleux & Compère, 2006, p. 52) than other communitarian providers.

Water cooperatives are, however, not fundamentally different from other communitarian organizations. In fact, most cooperatives were first established as water committees, or as a water system administered by an OTB, and were afterwards officially registered as a cooperative. Differences between the cooperatives and other organizations are therefore due to the fact that only the most stable providers decide to register as cooperatives (the reasons for this are explored in more details in Chapter 4).

A summary of the way in which water is provided in the conurbation is provided in Figure 3. As indicated in the figure, some communitarian water providers are federated through different associations, such as the ASICASUDD-EPSAS (Association of Communitarian Water Providers of the South, of the Department and of Providers of Water and Sanitation) and FECOAPAC (the Federation of Water Cooperatives of the Cochabamba Department).

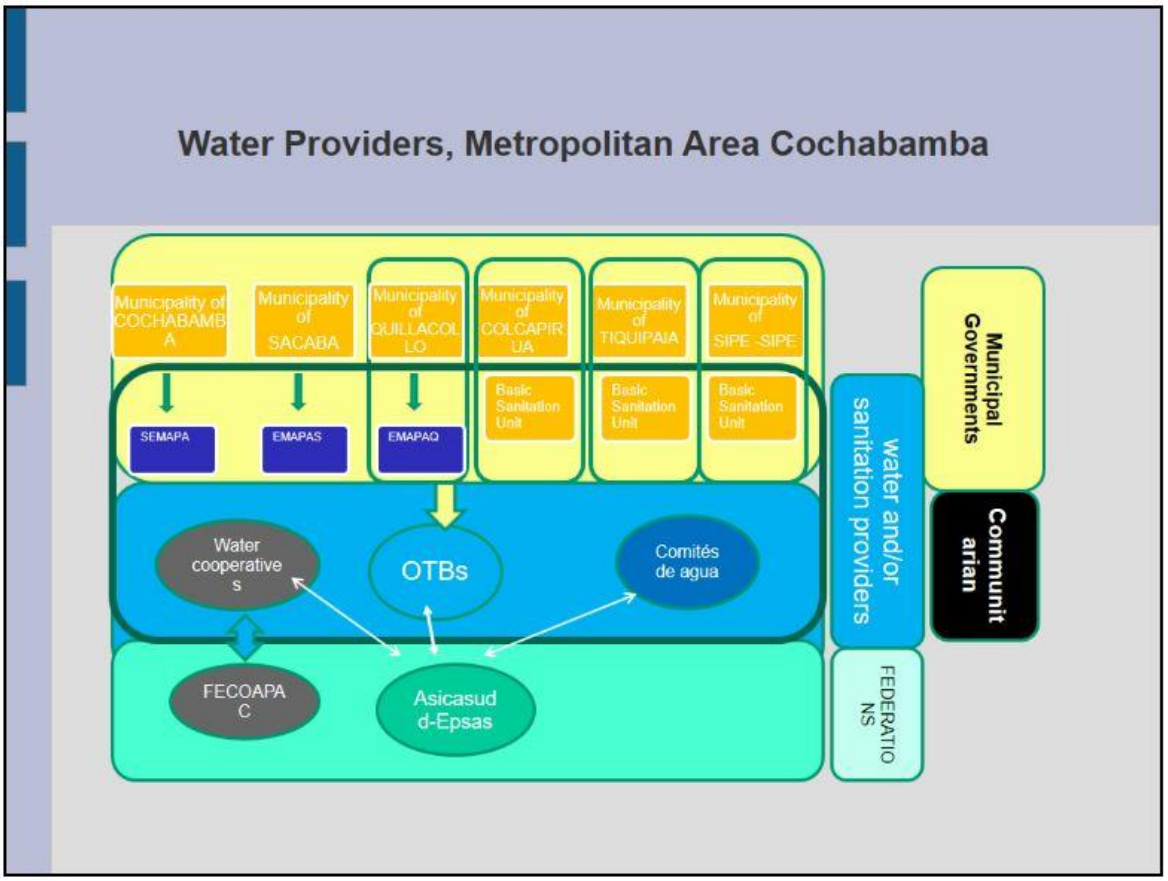

Figure 3: scheme of water providers in the conurbation. I elaborated this scheme through data collected during my fieldwork.

Those that do not have access to piped water, usually resort to privately run water trucks that provide expensive water of unreliable quality. Water trucks users in Cochabamba consume 4 time less water than those with a public connection (Ledo, 2013, p. 98) and pay 10 times more for water unit (Ledo, 2013, p. 76). Access to water varies strongly in different areas of the city, as newer and poorer neighbourhoods are forced into areas with worse access to natural sources and where the municipal network does not arrive (Walnycki, 2013).

Degraded environmental conditions in general and scarce access to potable water and sanitation are therefore linked to social and economic, but also geographical, marginality. In the impoverished southern periphery[6], 92% of the population suffers from some form of deficit in water or sewage access (Ledo, 2013, p. 62), as a scarce infrastructural investment

[6] The Southern part of the South Zone, excluding the oldest area near the city centre, where prices of the land can be quite high. Variability in conditions in the South Zone, and in peri-urban areas in general, are high.

and lack of resources, is compounded by overexploited, saline, aquifers (Ledo, 2013, p. 77) and high water contamination worsened by the presence of the municipal landfill of Kara Kara, and SEMAPA wastewater treatment plants (Alba Rancho) (Ledo, 2013, p. 107). Lack of water brings 'illnesses of poverty' such as diarrhoea, which represent a major cause of children mortality (Ledo, 2013: p.72) and lead to 35 years of difference in life expectancies between the south and the residential north of the city (Ledo, 2013: p.18), exemplifying that 'access to nature in the city can and is indeed often is a matter of life and death' (Swyngedouw, 2006, p. 105).

As Walnycki (2013, p. 137) argues, the problems of water provision in Cochabamba are neither generalized, nor recent, nor 'natural'. They are instead determined by economic and social factors, and political choices. To understand this uneven and fragmented landscape of water provision, it is therefore necessary to understand the long history of water governance in the Cochabamba Valleys and to analyse the way in which the conurbation evolved.

2.2. Building a fragmented waterscape: *haciendas*, rural reforms, and the expansion of the city.

This section examines how the Cochabamba waterscape was created and evolved before the neoliberal reforms of the 1980s - 1990s. This section underlines that the existence of contrasting imagined hydro-social territories, which still strongly influences the relationship between communitarian organizations and the state, has for a long time characterized the Cochabamba valley. State imaginaries are often based on ideas of progress and modernity and aims to make local territories 'comprehensible'. The state imagined hydro-social territories are usually the 'dominant' one (Boelens et al., 2016, p. 6; Hommes et al., 2016, p. 11; Hoogesteger et al., 2016, p. 94). In the Cochabamba valley as well as the rest of Bolivia, however, the state never obtained a complete control over the territory, neither in the city or in rural areas, and traditional systems of rights never disappeared. Attempts of the state to control and order the waterscape, through systems of rules and regulations or technological solutions aimed to bypass communities control, were never fully successful. The attempt of the state to assume control over an unruly waterscape is still present now, through the registration of water rights and providers (explored in Section 2.5). This section then

explores the elements that led to the present fragmented waterscape and underlines the continuous attempt of the state to control it.

The fact that the state never fully controlled the waterscape does not mean that the interventions of the state had no consequences: ideas of formality and informality led to the exclusions of parts of the city from public services, while 'acceptable' forms of informality were used to further the expansions of the municipal systems. Land reforms of 1952 were also fundamental for the redistribution of water rights. However, state imaginaries as well as its physical control over the territory, were always contested and challenged by both rural and urban actors, resulting in a fragmented waterscape.

The effects of this history are the basis on which water provision is built today. The slow acquisition of water sources from the part of Cochabamba municipal providers is still felt now, as other municipalities are asking for the returns of some water sources now placed in their areas, on the assumption that water from the MISICUNI dam would be enough for the city needs. The tension between rural and urban water users are still present, as discussions over the need to re-distribute water sources traditionally reserved for irrigations emerge. Communitarian providers themselves are included in this discussion, as some clash with rural communities, while others were able to reach agreements with irrigators to access their water sources. Cochabamba's water governance is then the results of the accumulation of water rights, imaginaries, histories, and infrastructures, and can really be understood only by taking into consideration its history.

Water had always been a stone of contention in the valley and attempts from the part of powerful elites to control this resource, instances of commercialization of water, and communitarian resistance to appropriation processes went on well ahead of the Water War of 2000. Cochabamba was founded in 1571 when Captain Geronimo Osorio was granted the right to establish the city of Villa Oropeza, later named Cochabamba (Guzman, 1972 in: Goldstein, 2004, p. 57). From the 17th to the 19th century the Cochabamba valleys were the breadbasket of Bolivia, providing food for the *altiplano* (high Andean plateau) mining regions through a system of *haciendas* (feudal landholdings) owned by city-dwelling elites and farmed by indigenous sharecroppers (Rivera, 1992 in: Goldstein, 2004, p. 57). Water control had a central role in the breaking up of the few indigenous communities left in the

valley. In 1874, the *Ley de Exvinculación* (Disentailment Law) imposed a process of land-privatization (Crespo Flores et al., 2004, pp. 39–41). In the *altiplano* (Andean plateau) communities violently resisted the break-up of community land but in Cochabamba this process was 'swift, peaceful, and complete' (Hines Thompson, 2015, p. 22; Alejo et al., 1995, p. 54). Land grabs (Crespo Flores et al., 2004, p. 40) and inequalities within Cochabamba communities partially explain their fragility, but it was the appropriation of water by community elites and *hacienda*-owners, and the 1870s catastrophic drought, that weakened any potential opposition (Hines Thompson, 2015, p. 11). The 1906 Water Law[7], furthermore, theoretically recognized water as a public good but largely favoured large land owners, and connected land ownership to water ownership (Walnycki, 2013, p. 84),

The new law, however, did not manage to dislodge the traditional water management in the valley, as system of irrigations managed through customary *mita* (water-turns) systems, continued to be *de facto* respected (Hines Thompson, 2015: 14). This did not impede the trading and renting of water. While free-trade regulations had in fact ruined many *hacienda*-owners, forcing them to sell part of their land, they often conserved mountain sources and water turns, while few families were able to secure extensive water rights (Hines Thompson, 2015: 11-24). An emerging class of small land-owners, which received community land or bought it from *haciendas*, was then often forced to purchase water turns (Hines Thompson, 2015: 14).

Water problems and differentiation of service were likewise already present in the city. Already in the 19th century, the municipal water system had difficulties to keep up with the growth of the city. Differentiation in service aggravated and contrast between rural and urban users started to emerge. Water infrastructures, consisting of a system of public taps, were already generally overtaxed at this point, but the South Zone, where most new migrants settled, was particularly underserved (Hines Thompson, 2015: p.25). At the beginning of the 20th century well-served residential suburbs grew North of the centre on the slopes of the Tunari range (where water sources are readily available) (Goldstein, 2003: p.63). The situation worsened after the 1932-1935 Cacho war, when veterans arrived in the city precipitating a housing crisis. The problem of land-trafficking emerged, as immigrants were

[7] The law is still valid, even if it has been modified in contradictory ways throughout the twentieth century (Beltrán, 2004, p. 15), as a new water law has been long in the work, but never approved

sold lots in the middle of rural areas, with the promise that (non-existent) services would follow (Goldstein, 2003: p.61-64). Water access in different areas of the city then varied dramatically: 'the longer established, whiter, wealthier, and closer to the cordillera a neighbourhood was, the better its water access. The Zona Sur [South Zone] lost out on all fronts' (Hines Thompson, 2015: p.57).

The need of the city to acquire new sources emerged starkly, leading with it tensions with rural water owners. The growing city did manage to expand its water frontiers, however rural water owners were still stably in control of the territory and were in practice able to establish which sources would be ceded to the city (Hines, 2015: 37-39).

Water and land ownership drastically changed after the 1952 revolution led by the MNR, The Rural Reform redistributed *haciendas* lands to their workers, creating new rural communities (Walnycki, 2013, p. 87) organized into rural unions (Alejo et al., 1995, p. 55). This reform was part of the MNR vision for a 'modern', national state, part of an attempt to transform 'indians' into 'peasants', a proletarian class ready to be integrated into the new national identity (Regalsky and Breña, 2010, p. 39; Centellas, 2013, p. 92; Albro, 2010, p. 74). While the creation of rural unions reinforced the link between communities and the state, they were not substituted by 'modern' individual connections (Walnycki, 2013b, p. 87), and it did not mean that the state acquired a firm control over rural territory. Likewise, the state had little power over water sources. While the rural reform did declare water sources property of the state, it gave them in common use to those receiving redistributed land and recognized the *mita* system. (Hines Thompson, 2015: 96-113). These policies then contributed to the Bolivian state institutional and legal pluralism, still apparent in Cochabamba water management (Walnycki, 2013, pp. 87–88).

These reforms had a profound effect on Cochabamba's water management and community organization. Water sources in Cochabamba were mostly redistributed to ex-*hacienda*-workers and small land-owners (Hines Thompson, 2015: 96-113), a re-distribution that is the basis of much of the current *mita* systems in the valley (Crespo Flores et al., 2004, pp. 44–45), while rural unions are the base of rural organizations existing in Cochabamba today and influenced the organizational forms of peri-urban water providers (Walnycki, 2013b, p. 87).

In the ex-rural District 2 of Sacaba, where I carried out case studies on two water cooperatives, the effects of the rural reforms are still clear, and well-remembered by the oldest inhabitants. Water sources placed in the mountain range were fundamental for water provision in the district. The way in which rights to these water sources were distributed can only be understood by putting it in a historical context. Rights to water sources in the mountain range are currently divided between the last descendent from an old family of land-owners, an association of irrigators, water cooperatives, and mountain-based rural communities. These rights are controlled through a series of private agreements, customary laws, and state laws. Historical changes in water rights, therefore, still strongly affect water distribution in the conurbation today.

The reforms also affected the city landscape. After the Urban and Agrarian Reforms, (1953 and 1956), the city underwent another migratory wave, as a new Municipal Regulatory Plan of 1961 tried in vain to control city growth (Chritèle and Delgado, 2007, pp. 117–119). The development of the outskirts of the city entrenched water segregation, as the municipality was unable to extend its water network (Hines Thompson, 2015: p.90). The municipality attempted again to obtain more water, but now whole communities protected their sources, making that difficult. The municipality was able to gain access to part of the Wara Wara and San Juan lakes water (Hines Thompson, 2015: 106). These were also the years when the Misicuni project (consisting of damning three rivers north of Cochabamba and channelling water to the city through an underground channel) (Walnycki, 2013, p.137) was first proposed as a solution to the city continuing water scarcity (Hines Thompson, 2015, p.122-127), underlining the start of the desire of the city to skip the messy pattern of ownership in the valley through technological solutions. The choices taken in this period still influence water management in Cochabamba today. The Misicuni dam is finally concluded (even if not fully operational) and posed to become the major water source of the conurbation. Due to the arrival of this water, the municipality of Sacaba, as well as the organization of irrigators of the District 2 of Sacaba, are asking for the restitution of the Wara Wara lake.

Lack of water also contributed to develop and strengthen neighbourhoods' organizations (Hines Thompson, 2015: pp. 113-119) that grew in peri-urban areas. Their members brought with them their experiences from miners and rural organizations, as the absence of the state forced them to organize to access essential services (Walnycki, 2013, p. 89). In the North Zone, neighbourhoods organized to exchange local water sources for access to the municipal

network (Hines, 2015: 113-119) increasing a trend started in the 1940s, in a state-supported ‘informal process of urbanization’ (Hines, 2015: 80). Where water was available, the first independent water providers were built. In the arid Southern Zone, inhabitants developed strong neighbourhood organizations to direct their requests to the municipality (Hines, 2015: 113-119) offering contribution in terms of money and infrastructures (Hines, 2015: 35).

Geographical settings, national politics, neighbourhood organizations, informal and formal rules all contributed to the construction of a fragmented waterscape, where the water service was co-produced by communitarian organizations and the state in a blurring of the concept of formality and informality. Evidence that both northern and southern neighbourhoods effectively contributed to the building of what is now the SEMAPA system underlines how the separation between the methods of state organizations and of communities are not clearly separate, emphasizing that informality is a fluid concept, and that both formal and informal behaviours can often be identified in the same organization (Ahlers et al., 2014). In the conurbation, municipal providers are strengthening a discourse that presents them as the ‘legitimate’ providers, a position that is strengthened by the fact that they characterise themselves as ‘public’ and communitarian organizations as ‘private’. Looking at the history of Cochabamba water governance, however, we can see that the division between public and communitarian organizations is not always simple.

Meanwhile the political situation had again changed, as Bolivia was subjected to military dictatorships from 1964 to 1982 (Cielo, 2010, pp. 25–26). The military sought to weaken the Workers Unions and to ally with the peasant, guaranteeing the rural reforms. While the state regained partial control of the territory, it was essentially unable to control unionized rural areas (Regalsky and Breña, 2010, pp. 39–40). The state, likewise, never gained complete control on urban territories, as Cochabamba continued its unruly growth. Illegal occupation of rural land worsened in the 1960s and 1970s, as rising prices encouraged rural landowners to sell their plots (Goldstein, 2004, p. 72). The growth of Cochabamba did not stop at the municipality borders. The construction of connection roads stimulated the east-west growth of the conurbation in the 1970s (Municipality of Sacaba, 2007, pp. 3–8), where most of the water cooperatives are now located. By the late 1970s, the municipality had lost control of the situation and started to implement exclusionary policies, declaring new settlements illegal with the consequences that it often had no control or authority over new neighbourhoods (Goldstein, 2004, pp. 77–79).

The lack of an effective control over the territory by the state was also in evidence when looking at water management. Attempts to impose control over the territory through a 'modernization' and simplification of the waterscape (with the support of international financial bodies and the foreign cooperation) largely failed. In the early 1960s, as a drought and protests about water scarcity enveloped Cochabamba, the government obtained foreign aid from the Federal Republic of Germany and the Inter-American Development Bank (BID) and new water plans were supported by the dictatorship of General Banzer. However, both rural and urban inhabitants did not passively accept centralist plans (Hines Thompson, 2015, pp. 129–130). Founded in 1973 to satisfy the BID loan requirements, SEMAPA tried to raise prices while menacing water cuts, and 'abolishing' independent systems, effectively a preview of what a private company would attempt in 2000. However, it had no real capacity to do either and the resistance from the citizenship to the steep water hikes plummeted rates of payment (Hines Thompson, 2015, pp. 164-165).

Clashes also took place with rural communities, as German engineers advised the municipality to drill artesian wells in the rural areas of Vinto, a solution that they assumed would not require negotiations with multiple users (Hines Thompson, 2015, pp. 124-127). Vinto farmers indicated (correctly) that deep wells would influence their own shallow wells, a claim refuted by state engineers. The project was nevertheless carried out by the government in a period of emergency drought. While farmers eventually ceded, in exchange for new wells, this conflict strengthened rural organizations, and engendered a stronger sense of ownership over water sources (Hines Thompson, 2015, pp. 169-175).

These conflicts underline once again how different levels of the state, not always acting in unison, intervened and influenced water management in Cochabamba, as well as emphasizing the capability of rural and urban organizations to maintain a certain degree of control of the territory. Furthermore, it was the same attempt of the state to control the territory, that strengthened the community's capacity for organization. The neo-liberal reforms of the state that culminated with an attempt to privatize water, would again bring unexpected consequences on rural and urban organizations. As the 1952 state was not able to control farmers through the construction of the unions, so the attempt to decentralize the state would results in fortifying both rural and urban organizations.

2.3. The neo-liberal years

This section looks at neo-liberal reforms in Bolivia in the 1980s and 1990s, focusing on the consequences they had on communitarian organizations, and municipal governments, specifically in the Cochabamba conurbation. The neo-liberal years lead to a re-organization of the Bolivian economy that led to mass migration from rural and miners' villages to urban areas. The migrants brought with them their forms of organization, which influenced the organization of urban neighbourhoods. The de-centralization policies of 1990s were intended to reinforce state authority, but they had very ambiguous consequences, as they strengthened the communitarian and neighbourhoods' organization that would become central in the contestation of neoliberalism, at the same time as the state was partially able to co-opt them. In Cochabamba the reforms brought a wave of neighbourhoods' legalization but did not improve water access. Tensions over water rose again between the state and rural users, as the state attempted to tame the waterscape, and assert control over water. These clashes led to the strengthening of the irrigators, as they protected their water access on the base of customary water rights.

Democracy returned in Bolivia in 1982. The country was in a deep economic crisis, tormented by a hyperinflation that reached 25,000% by 1985. The MNR party applied, guided by the International Monetary Fund (IMF), a package of structural adjustments that dramatically shrunk the state (Good, 2006, pp. 178–184). The national tin mines, in crisis after the collapse of international prices, were sold off. Between 1986 and 1992 around 30.000 miners lost their jobs, deeply diminishing the power of the COB (Bolivian Central Union) (Gill, 1997, pp. 294–295), as well as thousands of state and private sectors workers, unable to compete with cheap imports (Good, 2006, pp. 178–184). Entire miner's communities were 'relocated'. The majority moved to cities such as Cochabamba or El Alto (La Paz growing satellite city), others to the Chapare coca-growing regions, or abroad. Some of the older workers had acquired urban plots through miner cooperatives, but many had difficulty accessing housing and were forced into informal jobs, forcing strongly collectivist workers into individualistic survival strategies (Gill, 1997). The situation in the countryside

worsened: military interventions to suppress coca-production intensified in the low-land, while highland agriculture suffered due to land fragmentation (Healey, 2009, p. 84).

The reforms weakened state control. Since the 1970s, the state progressively lost control of agrarian communities, and privatization policies led communities to assert 'their rights to the autonomous management of resources', leading to 'local ungovernability' *(*Regalsky and Breña 2010, pp. 41-42). The situation became increasingly chaotic also in the cities as the 1980s drought triggered rural migration (CEDIB-Equipo Problemática Urbana, 2011, pp. 18–19) and migrants arrived from mining communities (Ledo, 2002 in Durán, 2007, p. 106). In Cochabamba, while the 1981 Regulatory Plan allowed the progressive incorporation of some new areas in the urban limits (Chritèle and Delgado, 2007, pp. 117–119), parts of the fast-growing peripheries were declared 'red zones', excluded from any future regularizations (Goldstein, 2004, pp. 76–78). At a national level, settlements in excluded areas kept growing well into the 1990s (Cielo, 2010, p. 68).

This policy of exclusions allowed land-trafficking to grow, but also encouraged the internal organization of neighbourhoods (Walnycki, 2013, p. 275) as new-comers brought their organizational experience to the city. Many of the water cooperatives in Cochabamba were founded in this period, and some carry the name of the mining community of their founders. Miners' organizational capabilities, political militancy and reputation as fighters are well known in Bolivia (Cielo, 2010; Walnycki, 2013; Gill, 1997). These were also highlighted by some of my interviewees, who identified their capability for organization in their experience as miners.

This does not mean that indigenous and miners' organizational structures were simply replicated in cities, as peri-urban communities organization and identity are shaped by both the previous experiences of the settlers and by the struggles that neighbours led together (Cielo, 2010, p. 79). Walnycki argues that, while miner communities and neighbourhoods with a strong rural presence often have strong organization and a shared identity, most neighbourhoods have neither, and their inhabitants might also simply aim at becoming 'like the centre' instead than focusing on auto-organizations (Walnycki, 2013, pp. 223–225; Walnycki, 2013b, p. 241). However, peri-urban water providers do often reference to 'indigenous and mining discourses to develop a sense of community' (Walnycki, 2013, p.

81), often based on an idealized notion of miners and rural communities (Walnycki, 2013, p. 172). Cooperatives (as they are explored in Chapter 4) often reference to their history to justify their control over the territory, emphasizing that the way in which these communities were formed strongly influences the waterscape and water governance in the conurbation.

In the 1990s, another wave of privatization was pushed forward by the Sánchez De Lozada government. The law of capitalizations effectively privatised fundamental state-owned industries (oil and gas, telecommunications, airlines, electricity, and railroads), while retaining 50% of each in state possession. Many state-employees were fired, while the cost of fundamental services such as electricity and water rose. State revenues fell, in part due to a cut in royalties and taxes for oil exploitation (which represented 48% of state revenues) (Kohl, 2002, pp. 456–460).

The reforms were accompanied by an effort to create a more inclusive national citizenship with the aim of restoring the legitimacy of the state, damaged by the 'excesses' of neoliberalism (Cielo, 2010, p. 68; Medeiros, 2001, p. 402). These reforms represented the convergence of the government neoliberalist and indigenist tendencies (Medeiros, 2001, p. 411) but also an example of a second wave of reforms in Latin America, with decentralization as key (CEDIB, Equipo Problemàtica Urbana, 2011, p. 12). The new constitution declared Bolivia a 'pluri-cultural, multi-ethnic' nation, and gave new political and cultural rights to indigenous peoples, including recognizing traditional community authorities (Perreault, 2005, p. 272; Albro, 2010, p. 75). However, these new rights were limited by neoliberal reforms that 'tended to undercut livelihood options' (Perreault, 2005, p. 272).

The LPP (Law of Popular Participation, 1994) is a major example of tension during the reforms and it had the most contradictory consequences. It created 311 new municipalities: which were assigned 20% of the state budget, (Kohl, 2002, pp. 457–462), and the responsibility to deliver basic services such as schools, roads, and irrigation systems (Kohl, 2002, p. 464). Crucially, it gave to communitarian organizations the possibility to receive legal personhoods as OTB (Grassroots Territorial Organization), (CEDIB-Equipo Problemática Urbana, 2011, pp. 6–7). OTBs became the official representative of each territory to the state, in charge of negotiating with the municipality which projects were

needed to improve their neighbourhoods (Kohl, 2002, pp. 457–462). It also mandated the creation of municipal oversight committees formed by OTB members (Kohl, 2002, pp. 457–462).

Decentralization policies were seen as a way to strengthen democracy but choices on offer were limited to the neoliberal model: while municipalities were given new competencies, the management of some services, such as water and solid waste were passed to private businesses or municipal autonomous entities. The role of 'neoliberal' municipalities was limited to 'application of pro-poor programs', 'maintenance and the construction of infrastructures' (CEDIB, Equipo Problemàtica Urbana, 2011, pp. 20–22). Municipalities, moreover, had limited control over their territory, as they were excluded from participating in the governance of 'oil and gas, mineral, and hydraulic resources' while they were, contradictorily, put in charge of sustainable development (Kohl, 2002, p. 465).

The law also had contradictory effects on communitarian associations. It recognized a variety of associations from neighbourhood committees to indigenous *ayllus* (Albro, 2010, p. 75) and aimed at articulating their 'ethnic democracy' to the 'European' democracy of the Bolivian state (Alejo et al., 1995, p. 158). This model allowed participation within restricted margins (Medeiros, 2001, p. 401), limiting the communities' capability to intervene in large-scale policies, and, in general, recasting political issues 'in terms of purely technical problems calling for technical solutions' (Medeiros, 2001, p. 403). It therefore focused the attention of popular organizations on local issues, and imposed the OTB as the only actors to negotiate at municipality level, (CEDIB, Equipo Problemàtica Urbana, 2011, p. 12) fuelling possible contrasts with other territorial organizations. Furthermore, it risked favouring only local elites, used to deal with state authorities (Alejo et al., 1995, pp. 160–163). While decentralization policies theoretically intended to give more autonomy to communities, and to respond to the historical and growing tensions between the central state and regional governments (Kohl, 2002, p. 458), they, in fact, expanded the reach of state authority (Kohl, 2002, p. 467), as also intended by Sanchez De Lozada, (Perreault, 2005, p. 272).

However, reforms did not have univocal effects, and decentralization created new spaces of political organizations and social mobilizations (Perreault, 2005, p. 279). Perrault argues that

‘TBOs [OTBs] and oversight committees in many cases do enhance local participation and provide a valuable base for political organizing,’ and that the LLP is one of the causes for the high number of indigenous candidates elected in the 2002 elections (Perreault, 2005, p. 273). Moreover, state restructuring ‘served to territorialize opposition to privatization and neoliberal economic policies and, in some areas, reinforce regional social movements’ (Kohl, 2002, p. 449). The reforms, moreover, recognized the validity of customary laws that were used to substantiate local and territorial requests and protests (Albro, 2010, p. 85).

The LLP had profound consequences in the Cochabamba valley. It enlarged the jurisdiction of the municipality over rural areas (Perreault, 2005, p. 273) so that neighbourhoods seated in on rural land came to be part of the municipality, at the same time as the municipality acquired competencies over land use and ordering (Chritèle and Delgado, 2007, p.120) bringing massive regulation. However, the LLP policies did not provide a legal alternative to the informal land-market (Chritèle and Delgado, 2007, pp. 5–10) so that speculation and prices rose. Clientelist relationship between communities and departmental authorities strengthened, as neighbourhoods without legal land titles were recognized as OTBs, underlining the nebulous delimitation between formality and informality and the role of the state in co-creating ‘illegal’ settlements (Cielo, 2010, p. 123)

The law also modified the relationship between communitarian organization and the state. Neighbourhood councils had existed since the 1930s in Cochabamba, and by the 1940s they were organized in a federation (FEJUVE), which had a fundamental role in mediating with the authorities regarding the need of the neighbourhoods (Mejía Coca et al., 2009, pp. 155–158). The LLP officially recognized these organizations, however the competition for projects generated rivalries between organizations and facilitated the creation of clientelist networks (Mejía Coca et al., 2009, p.163). While the political situation deeply changed, clientelist structure are still well-established. Some of my respondents, in fact, reported that projects depended from political support to the party in power. The OTBs are still today a fundamental actor in peri-urban areas, and one of the main form of contact between urban communities and the state. LLP funding has also been used to carry out infrastructural works for autonomous water providers. However, the presence of the OTB, and the use of LLP funding, is also used to strengthen the control of the state over water system placed outside their areas (see Chapter 4). The foundation of the OTBs still has a strong influence in water governance in peri-urban areas.

The LLP did not improve the municipal capability to provide services to the peripheral population (Chritéle & Delgado, 2007, p.10), as SEMAPA continued to be underfunded, (less of 1% of public spending) and to privilege the city centre (Walnycki, 2013, p.148). While the LPP aimed to strengthened local water governance it was in fact rife with inconsistencies: it gave more funding to the municipality, but most was earmarked for projects implementation, leaving little for maintenance and monitoring water quality (Perreault, 2005, p. 273).

The 1990s were a period of intense struggle over water in Cochabamba; as attempts to order and tame the waterscape largely failed, the influence of international organization rose. SEMAPA, government and international organizations largely failed to transform urban users into obedient costumers (Hines Thompson, 2015, pp. 193-200). Price hikes, justified to obtain loans, to extend the service and to avoid privatizations were delayed multiple times by users (Hines Thompson, 2015, pp. 204-215). The same institutions attempted to tame the unruly countryside, launching a series of studies aimed at making the valley waterscape knowable and to 'rationalize it.' However, conflict intensified between the municipality and rural and provincial users that opposed the projects of SEMAPA to drill new wells in the Vinto/Sipe-Sipe area (Hines Thompson, 2015, pp.193-200). Even when SEMAPA managed to build some wells in the El Paso area, it did not manage to impose the principle of state ownership on water resources (Hines Thompson, 2015, pp. 200). Far from disciplining the countryside, the conflict led to the foundation of FEDECOR (Cochabamba Irrigators' federations) in 1997, aimed at defending their historic rights to water (Hines Thompson, 2015, p. 201) (Crespo Flores et al., 2004, pp. 57–60).

At the core, the conflict concerned who had the right to water. The state responded to the claim of the irrigators by referencing the constitution that held the state as the owner of water sources. However, there were contradictions within different laws (Hines Thompson, 2015, p. 201). Customary rights, the core of the irrigators' water rights, were acknowledged by the Constitutions, the INRA Law and the LLP (Perreault, 2008, p. 840). However, most usufruct claims by communitarian organizations over irrigation systems and sources were not legally recognized, thus creating uncertainty. Moreover, decentralization policies created confusion over who was supposed to mediate conflicts, as regional governments were weakened and the municipality had often neither the jurisdiction nor the expertise to mediate resource disputes (Perreault, 2005, pp. 275–277), a confusion that is well in evidence today, as

different levels of the government, including some newly created organizations, are uncertain over who is in charge of solving the numerous inter-communities (and inter-municipalities) conflicts that characterize the conurbation.

Irrigators made defence of customary rights (*usos y costumbres*) central to their fight. The concept of *usos y costumbres* goes back to Spanish law but it resurfaced in the 'political and legal discourse' in the 1990s. The concept itself is not void of contradictions. Customary rights are changeable and place-specific, which lead to inherent difficulties in granting legal protections while allowing flexibility (Perreault, 2005, p. 276). Furthermore, such claims risk to advantage only a relatively privileged part of the rural populations, those with access to fertile land served by irrigation systems (Walnycki, 2013, pp. 145–146). The FEDECOR emphasized that these rules come from their forefathers in a bid to reinforce the legitimacy of their access to water (Crespo Flores et al., 2004, p. 49). The concept is often used in essentialized manners, claimed as 'ancient costumes' (even if many irrigation systems date from the 1953 rural reform). However, the effective historical authenticity of these rights is not as important as their use as an instrument not only to revendicate rights but also to create a local identity and to emphasize political autonomy (Perreault, 2008, p. 841). Furthermore, participation to the maintenance, construction, and defence of these systems is also fundamental to water access (Crespo Flores et al., 2004, p. 44).

The neo-liberal years then had contradictory but lasting effects on water governance in the conurbation. The effects of such policies are still visible today, as the OTB remains one of the main forms of contact between peri-urban communities and the state, while the irrigators maintain an influence over water sources and water policy in the conurbation.

As the state attempted to control the waterscape, groups that would oppose water privatization were strengthened. The irrigators would become central actors in the Cochabamba Water War, while neighbourhoods organizations claimed a central role in both the Water War and in the upraising of El Alto, during the Gas War.

2.4. The era of rebellions

A new period of revolt and resistance characterized the early 2000s, of which the most significant examples are: the 'Water War' of Cochabamba against the new Potable Water Law and the privatization of SEMAPA, and the 'Gas War', a protest opposing the export of natural gas through a Chilean port. These resistance movements were connected to the question of who, how, and at what scale, can access and control resources; but also to the question of day-to-day life, inequality and democracy (Perreault, 2006, pp. 153–158). As such, they should be analysed at different levels. The Water War will be analysed in more detail, focusing especially on the local and regional context, and its effect on Cochabamba water governance. However, the analysis of the national and international levels is also necessary, as the discussion of scale remains fundamental to an understanding of Cochabamba water governance.

Both Water and the Gas Wars were, in part, consequences of international trends that led to the rescaling and re-institutionalization of resources governance (Perreault, 2006, p. 152). The privatization of SEMAPA was the consequence of a World Bank policy (Crespo Flores, 2000, p. 60): the privatization of water providers was included in the Bolivian debt relief conditions (Shultz and Draper, 2008, p. 15) and it led also to the privatization of La Paz/El Alto municipal provider, given in concession to the French transnational Suez (Perreault, 2006, p. 160). Bolivian protests can also be analysed as part of an international pushback, as the Water War can be considered part of the global 'new social movements' that started to organize against neoliberal globalization in the early 2000s (Crespo Flores, 2000, p. 59).

The national context is also of primary importance. Neoliberal reforms represent a continuation of colonial and neo-colonial projects that for centuries robbed the country of its natural resources. The protests were based on the tradition of revolts of workers and indigenous people (Perreault, 2006, p. 168) . The protests, furthermore, put into doubt the political and economic model of the Bolivian state, that aimed to depoliticise communitarian and workers organizations, making political parties the only legitimate link between government and population (Crespo Flores, 2000, p. 59). Therefore, the Water War can be read as a crisis of the methods of governmentality used by the Bolivian state (Crespo Flores,

2000, pp. 65-66), compounded by the fact that central state never had complete control over natural resources (Perreault, 2006, p.152).

Local components are fundamental, especially those connected with the livelihood of Cochabamba rural and peri-urban sector. One of the key issues that emerged from the Water War, in fact, concerned the defence of customary rights that were and still are 'inherently local' (Perreault, 2006, p.159). Another fundamental element is the growing importance of neighbourhood's associations. The sense of community created by neighbourhood associations through the construction of their own networks was a fundamental element in the Water War (Walnycki, 2013). In El Alto, 'neighbourhood micro-governments,' had a fundamental role in organizing the resistance (Mamani Ramìrez, 2005, pp. 7–12). Therefore, the Water War in Cochabamba, can be considered as the results of policies and influences at varied scales, but also the results of a long local history of clashes over water and communitarian resistance against dispossession of natural resources.

Tensions over water in Cochabamba started to intensify in 1996 when the Mayor announced a World Bank loan dependent on the privatizations of SEMAPA. As a prelude for the concession bid, the government transformed SEMAPA in a conurbation-wide organization (Ledo, 2013, p.73) with the prefect as president (Hines Thompson, 2015, p. 213). Urban popular groups opposed the move, fearing water hikes, while officials and organizations of the conurbation smaller municipalities saw it as a menace to their systems. The supreme court reinstalled the mayor as the president of SEMAPA (Hines Thompson, 2015, pp. 221-222) and the government made some concessions to the population, promising to involve local authorities, limit prices hikes and add the Misicuni projects to future concession (Hines, 2015, pp. 222-223).

The request for the inclusion of the Misicuni underlines tensions between the region and the government. Misicuni had been at the centre of local debates and electoral promises for 50 years and it represents not only the solution for Cochabamba water problems but is also a symbol of departmental development and autonomy (Laurie and Marvin, 1999, pp. 1405–1404). This first inkling of the 'Water War' therefore underlined tensions concerning the level at which water management should be carried out, questions that are still at the centre of Cochabamba water governance arrangements.

In 1998, a public call for concession was won by Agua de Tunari, the only organization present. It was an international consortium led by Bechtel, an US engineering firm (Shultz and Draper, 2008, pp. 15–16) legally based in the Cayman Islands (Crespo Flores, 2000, p.60). Closed-door negotiations with representatives from the municipal, regional and central state, produced a 40 years concession, very favourable to the private tender, and mostly undisclosed to the public. It guaranteed a 16% yearly profit, and exclusive monopoly over water sources. Investment for Misicuni was not guaranteed (Shultz and Draper, 2008, p. 16; Torrico et al., 2013, p. 45). Five weeks after the contract was signed the Banzer government passed the Law 2029 on Potable Water (Crespo Flores, 2000, pp. 60-61). The law legitimized the contract (Torrico et al., 2013, p. 45) as it decreed that the activities of autonomous water providers (even private wells) were illegal in a concession area (Torrico et al., 2013, p. 36).

Local authorities did not initially resist privatization: the mayor was linked by an inter-party's pact with the government, and many neighbourhood councils were linked to the mayor's party (Torrico et al., 2013, p. 33). The FEJUVE itself had become rife with clientelism after the decentralization reforms (Torrico et al., 2013, p. 63). Due to a lack of formal leadership, the protests coalesced around informal representatives. The creation of the *Coordinadora*, an organization created outside formal structure of political actions (Torrico et al., 2013, p. 47) can be seen as a consequence of the perceived 'failure of local institutions to look out for public interests' (Shultz and Draper, 2008, p. 17).

The Water War was unique in that the population in general participated (Torrico et al., 2013, p. 36). The new law and the contract affected different sectors of the population in the whole conurbation (Torrico et al., 2013, p. 45). The urban population were affected by the rise of tariffs, while peri-urban organizations and irrigators risked losing their systems and wells (Torrico et al., 2013, p. 45) (Crespo Flores et al., 2004, p. 86). The FEDECOR was a central actor. Organizing a first meeting with Oscar Olivera, leader of the union of factory workers, and with organizations of environmental activists, it gave the impulse for the formation of the *Coordinadora* (Shultz and Draper, 2008, p. 17). Urban actors came from different sectors of the population. Professionals gave technical and legal support to the *Coordinadora*, (Torrico et al., 2013, pp. 58-59). Neighbourhood organizations and water providers of peri-urban areas (especially the South Zone, not politically controlled by the mayor), were fundamental in transmitting information and became a place of debate. Most

of their neighbourhoods were not served by SEMAPA. Apart from the risk of expropriation (Torrico et al., 2013, pp. 61-64) their protest also symbolized the request for fair access to water resources (Crespo Flores, 2000, p. 65). Forms of protest reflected this diversity, ranging from road blocks and marches, to symbolic burning of water bills, and legal challenges. The protesters also used new technologies bringing their fight on a global stage (Crespo Flores, 2000, p. 64).

In January 2000, a few weeks after the start of the concession, water bills increased by 51% on average. Open assemblies and road blocks were organized by the *Coordinadora* to ask for the derogation of the law, and the annulment of the contract (Torrico et al., 2013, pp. 47–48) (Shultz and Draper, 2008, p. 19). Citizens started to refuse to pay water bills (Shultz and Draper, 2008, p. 20). In February, after failed negotiation, another mobilization started. The new government, headed by Banzer, Bolivia former dictator, transferred 1000 police officers from outside the province with the results of increasing support to the protests (Shultz and Draper, 2008, p. 21). The situation degenerated into a city-wide conflict, supported by the union of coca growers (Shultz and Draper, 2008, p. 21). New negotiation brought the promise of a six months roll-back of bill rises (Shultz and Draper, 2008, p. 21), a promise soon renegaded (Torrico et al., 2013, p. 51).

The protesters were able to obtain a copy of the contract with the water company, that was examined with help of professionals, and deemed unacceptable (Shultz and Draper, 2008, p. 22). To legitimise the decision to fight until the annulment of the contract, an informal referendum was organized. More than 50 000 people participated, with 90% voting for the contract annulment and the modification of the law 2029. In April, an indeterminate strike and road blocks left Cochabamba completely paralyzed (Torrico et al., 2013, p. 53). The governor asked the government to cancel the contract and resigned publicly declaring that he feared a 'bloodbath' (Shultz and Draper, 2008, p. 24). In April 8th, the government declared the state of siege (Torrico et al., 2013, p. 53) and suspended constitutional rights (Shultz and Draper, 2008, p. 25). The leaders of the *Coordinadora* that had not been arrested went into hiding (Shultz and Draper, 2008, p. 25). As soldiers entered the city, the protests restarted. The army used real bullets, which resulted in the death of a 17-year-old boy, Hugo Daza (Shultz and Draper, 2008, p. 25). On the April 10th, the officials of Agua del Tunari fled the country (Shultz and Draper, 2008, p. 26).

The government broke the contract with Agua del Tunari (Torrico et al., 2013, p. 54) and in April a new Potable Water Law (law 2066) was approved. It acknowledged customary water rights, guaranteed public consultation, and limited the power of the Superintendent for water to potable water and sewage (Perreault, 2005, p. 275). The *Coordinadora* took (temporarily) charge of the company (Crespo Flores, 2000, p. 62).

After the Water War, the unrest in the country did not stop, and it intensified in 2003. This period of turbulences reached its peak in September-October 2003, leading to the 'Gas War'. On September 20th, the army arrived to the villages of Warisata/Sorata to disassemble a road-block that had stranded various tourists. Five people were killed among whom a small child (Shultz and Draper, 2008, pp. 83–84) (Mamani Ramìrez, 2005, p. 50). This massacre created a sentiment of 'belonging to the same social identity' in the city and in rural areas, as different social forces started to coalesce in the city of El Alto (Mamani Ramìrez, 2005, p. 50). The tensions came to a head when the Lozada Government agreed a low selling point for gas exported to the US through a Chilean port, incensing the historical hostility against a country that in 1879 had seized the Bolivian coastline (Shultz and Draper, 2008, p. 91). The protesters asked for the nationalization and the industrialization of Bolivian gas and oil (Shultz and Draper, 2008, p. 90), the central points of the 'October Agenda'. Citizens blockaded El Alto, leaving La Paz nearly isolated. On October 11th, Sanchez de Lozada declared the state of emergency and sent in the army. More than 60 people died during the September and October protests and hundreds were wounded. As the protests spread and the number of deaths rose, even the middle classes and part of the elite started to demand the resignation of the president. On October 2003, Lozada resigned and fled the country for the US, and vice-president Carlo Mesa was sworn into office (Shultz and Draper, 2008, pp. 92–94).

After the departure of Lozada, a limited Gas and Oil law was passed while social movements protested in favour of the nationalization of the oil and gas industry (Shultz and Draper, 2008, pp. 97–98). Protest in Al Alto also brought to the cancellation of the private water concession (Perreault 2006: p.160). Mesa resigned in June 2005, as protests restarted in the whole country (Shultz and Draper, 2008, pp. 97–98*)*. In December 2005, new elections were called. For the first time in 20 years, a candidate had an absolute majority, and Evo Morales of the MAS, leader of the union of Coca growers and Bolivia first indigenous president, was elected with 53.7% of the national vote (Healey, 2009, p. 85).

2.5. Conflicts and contradictions of a 'post-neoliberalist' Bolivia

The election of Evo Morales represented the end of a 'peculiar form of Andean apartheid' (Kohl and Bresnahan, 2010, p. 6), and the start of what the Bolivian government calls the 'process of change' (*proceso de cambio*) a 'multidimensional project' (Kohl and Bresnahan, 2010, p. 8) based on a 're-foundation' of the state, necessary to heal the *de facto* exclusion of the indigenous population from full citizenship (Dunkerley, 2007, p. 150). To strengthen this process, a new constitutional assembly was called (Zegada et al., 2011, p. 49).

These political changes encountered a fierce opposition by regional elites in the oriental low-lands (where most the of the hydro-carbon fields were located) as they campaigned for regional autonomy (Zegada et al., 2011, p. 46), managing to obtain a referendum on the issue. Gustafson argues that 'the departmental autonomy project is at base an anti-democratic defence of race and class privilege' (Gustafson, 2009, p. 1011).

In 2006, both the elections for the constitutional assembly and the referendum for regional autonomy were called. The MAS party obtained 50,7% in the election, and on a national level the 'no' won on the referendum (Zegada et al., 2011, pp. 47–48). Due to the unrest that surrounded drafting the constitutions, the government moved the assembly to Oruro, and quickly approved the constitution, in a move that have been criticized as authoritarian, even if the constitution was afterwards approved via a referendum (Walnycki, 2013, pp. 108–109).

The constitution acknowledges Bolivia as a pluri-national state (Gustafson, 2009, p. 1004) and contained 'new possibilities for indigenous authonomy,' a 'deep recognitions of indigenous rights and culture,' 'new channels for democratic participation' and partial concession to regional autonomy (Cunha Filho, 2016, p. 235). However, this position was accompanied by a 'strong stance on sovereign control over oil, and especially natural gas' (Gustafson, 2009, p. 988) creating tensions between strengthening the central state and indigenous populations control over their territory (Kohl and Bresnahan, 2010, p. 6) underlining the difficulty to articulate 'indigenous rights with a resurgent nationalist agenda' (Gustafson 2009, p.1001). These tensions, united with a continuous reliance on extractives

industries and scarce attentions to their environmental consequences (Kohl and Bresnahan, 2010, p. 19), put in doubt the supposedly 'post-neoliberalism' of the Bolivian government, as it contrasted two of the main 'pillars' of Evo Morales government post-neoliberal governance: 'nature' and 'community' (Marston, 2012, p. ii). This contrast also emerged during my field work, materializing in the tension between the state's acknowledgement of communitarian providers and the strengthening of the role of the state in water provision.

Evo Morales' image abroad is that of a defender of environmental and indigenous rights (Walnycki, 2013, p. 105). He also has a solid internal popularity. After the approval of the constitution Morales was re-elected two times, the last in 2014 with a 61% majority (Webber, 2016, p. 1856). His government reached considerable achievements, characterized by a strong economic growth and social mobility (Cunha Filho, 2016, p. 235), underlined by a grown presence of indigenous people in state institutions (Kohl and Bresnahan 2010, p.18) Poverty and extreme poverty decreased respectively from 62,4% to 36,3% and from 37,1% to 18.7% between 2002 and 2011. This was accompanied by large-scale infrastructural programs, social programs based on cash transfer, rising incomes, and the decline of illiteracy (Webber, 2016, p. 1857) (Cunha Filho, 2016, p.236)

While some criticisms and frustration addressed at the government might be due to the high hopes that were placed on it, tensions are indubitably present (Cunha Filho, 2016: p.236). Morales was elected on the promise of the nationalization of gas, the rebuilding the National Oil and Gas Company *(*YPFB, 'capitalised' in the 1980s) (Shultz and Draper, 2008, pp. 83–84) and to renegotiate gas contracts (Shultz and Draper, 2008, pp. 99–100) (Healey, 2009, p. 85). A real nationalization never took place but higher taxes and royalties brought a strong increase in state revenues (Bebbington and Humphreys Bebbington, 2011, p. 138). The government aimed to increase the role of the state (Kohl and Bresnahan, 2010, p. 17) and to diversify the economy through industrialization. However, the latter proved significantly difficult (Kohl and Bresnahan, 2010, p.17). Mining activities are therefore central to finance social projects, whose 'visibility' and a 'reach' make them fundamental for the government (Bebbington and Humphreys Bebbington 2011, pp.138-139).

These tensions are made starkly visible by indigenous population protests over resources extraction and infrastructure developments in their territory (e.g. the TIPNIS resistance see:

Laing, 2015). While the Bolivian constitution acknowledges the rights of indigenous people on their territory (Gustafson, 2009, p. 988), 'non-renewable resources remain under control of the state' (Gustafson, 2009, p.1006). The Bolivian state embraced the argument that 'the subsoil belongs to the nation, and that it should be extracted so that its benefits can be shared.' However, benefits and damage are unevenly distributed, as places where 'value is extracted' face the brunt of environmental degrade and destruction of livelihood sources (Bebbington and Humphreys Bebbington, 2011, p.143).

The general tensions between state centralization, and the reinforcement of community organization can be observed in the water sector, on which transformation aimed at (re)nationalising and centralising state control over water provision, reforming legislation and regulation, and institutional development and reform.' A Ministry for Water was created, which was a longstanding request from popular movements. Central agencies dedicated to the regulation of the water sector (the AAPS), to the support and development of capabilities for water providers (SENASBA) and for the execution of water-related projects (EMAGUA) were built. The constitution also pays attention to water issues. The right to water is enshrined in the constitution, as is the rejection of privatization (even if 'mixed' providers are allowed). The constitution declares the responsibility of the state in providing the service, but also recognizes communitarian providers, customary rights, and social participation in the management of water (Walnycki, 2013, pp. 121-123).

The affirmation of the centrality of the state in bringing the water service, and the simultaneous acknowledgement of communitarian water providers is an ambiguity central to Cochabamba water governance current tensions. Clarification into respective roles could be brought by a comprehensive Water Law, that has, however, long been under discussion with no approval in sight. A real change in the overall vision of water provision has not appeared: SEMAPA (and other municipal providers) continues to aim to a model of universal provision (Walnycki, 2013, p. 134). While the state now officially recognizes (and seeks to register through the AAPS) communitarian water providers, there are not enough resources to really improve their capabilities and level or service (Walnycki, 2013, p. 99). The Cochabamba waterscape is still fragmented, and many water activists and community leaders fear that the state aims to encroach, and eventually dissolve, their providers (Walnycki, 2013, pp. 132–133). The regulation of these organizations, moreover, is taking place at the central state level, in a process of centralization, mirroring the attempt of the

state to retake control of natural resource governance. In conclusion, while state authorities do not actively exclude peri-urban providers, they do not actively support their existence either, as they are simply allowed to operate in areas that the state cannot yet reach (Marston, 2012, p. 58). The Water War then put an end to privatization attempts, but it did not bring a long-term change in water governance, especially in peri-urban Cochabamba, neither did it solve the tension concerning water governance in the valley, nor end the menace on independent water providers. In fact, problems connected to the scale of water governance, and to who is a legitimate provider are very much alive (Walnycki, 2013: 168).

After the Water War, the radical requests of the *Coordinadora* for a socially-controlled utility were eventually moderated in the concession for socially elected representatives in the Boards of Directors. However the low participation of the population (Kooy and Bakker, 2008, pp. 238–239) led to a stop of these elections by 2011 (Marston, 2012, pp. 121–122). Furthermore, the movement that led the water war also started to fragment and weaken. Irrigators and peri-urban potable water providers went separate ways. There is also a widely held opinion between water activists and academics that the heads of some water organizations have been co-opted by the state (Walnycki, 2013, p. 101).

Furthermore, infrastructural works in Cochabamba have followed the national trend towards visible infrastructures works with an 'immediate political payoffs' (Webber, 2016, p. 1866). Large scale projects have been pushed as the solutions to the conurbation water and sanitation issues. The Misicuni project seems to finally approach completion. Water from the Misicuni dam should provide potable water and water for irrigation to the Cochabamba valley, and the whole Water and Sanitation Masterplan for the Conurbation hinges on it. However, it still presents technical and administrative problems (Crespo Flores, 2016). Additionally, during my fieldwork, it was still not clear how the water would be distributed to the various municipalities, and by which organizations, nor the answer seems to be near now (Crespo Flores, 2016).

Putting forward a project that had been shut down by the Water War and precedent protests, the idea of a metropolitan (i.e. conurbation wide) water provider has been floated again, but it is not clear who this provider will be, or what should be its function. In April 2017, the Ministry for the Environment and Water and the departmental government announced the

need to strengthen a 'metropolitan water institution,' that would administer and distribute the water coming from Misicuni to the various municipalities. However, the very existence of such an organization was contested by the manager of SEMAPA. The president SEMAPA's board, furthermore, announced the intention to transform SEMAPA in a metropolitan provider, seeing in the actions of the regional government an attempt to monopolize and profit from Misicuni (Los Tiempos, 2017a). At the same time, both Quillacollo and Sacaba are strengthening their own water providers. While spatial borders between the municipalities are nearly imperceptible, little coordination seems to exist between them (Ledo, 2013, p. 20).

The Water War and the government's reforms had then produced long-term but contradictory consequences in Cochabamba. The federation of irrigators, FEDECOR, was particularly strengthened by the Water War. It contributed to create the first National Organization of Irrigators in 2003 (Perreault, 2005, p. 277) and was able to 'influence water politics and legislation, most notably the River Law of 2004, that protected their water rights' (Walnycki, 2013, p. 143), acting through networked alliances (Perreault, 2008). In 2003, communitarian water providers of the South Zone founded the umbrella organization ASICASUDD (now ASICASUDD-EPSA), that protects potable water providers interests, and pushes for a co-management model, where communities and the state would collaborate to bring the water service (Walnycki, 2013, p. 171). The water cooperatives, some of which had a very active role during the water war, also organized to found FECOAPAC[8] in 2003. The National Federation of Water Cooperatives (based in the Santa Cruz de la Sierra, where water cooperatives dominate water provision) was founded in 2009 with the collaboration of both Cochabamba and Santa Cruz de la Sierra water cooperative federations and was officially recognized[9] in 2012. Furthermore, many of the cooperatives that exist in Cochabamba decided to officially register around the time of the water war in an attempt to protect their water system (this will be discussed more in depth in Chapter 4). On a whole, the water war had the consequence of organizing and bringing to the foreground water organizations that operate in the conurbation, while also strongly politicizing water discourses in the valley.

[8] Interview first president FECOAPAC, 17/06/2014
[9] Interview President FENCOPAS, 07/02/2014

Therefore, the current situation concerning water governance in the Cochabamba valley is quite contradictory, as communitarian organizations have been reinforced by their officialization and by the creations of networks. These networks are necessary for their capability to influence governance (see Chapter 6). However, the state influence in the water governance has also been strengthened, as the state focus its attentions on the construction of large scale infrastructures that will reinforce its control over the waterscape (see Chapter 6).

Furthermore, Campanini (2015) argues that due to the process of urbanization, and the pressure to enlarge the legal borders of the urban areas (especially in water rich areas), led to a decline of agriculture in the valley weakening the irrigators organization. Furthermore, various activists and academics in Cochabamba shared the view that some heads of the water movement have been co-opted by the state.

Meanwhile, the conurbation keeps growing in an unplanned way. Conflicts over the land are growing between agriculturist communities and new irregular neighbourhoods in peri-urban areas, where communities do not have any more complete social control over their communal lands (Opinión, 2012). As land speculation pushes prices higher (Ledo, 2013, pp. 20-22), new settlements grow in areas that were previously avoided, due to elevation, lack of water sources and contaminations. This led the 'peripherizations of the most extreme poverty' in neighbourhoods that are often not recognized by the state (Walnycki, 2013, pp.161-162), but have the lowest land prices (Ledo, 2013, pp.20-21).

Conflicts are getting worse as water sources become overexploited (Walnycki, 2013), and were made even more generalized after I left the field, due to the drought that recently hit Cochabamba. In the middle of this crisis, water waste is rife in valley, as the main methods of irrigation in Cochabamba is still flooding, and SEMAPA currently loses 50% of its water (Crespo Flores, 2016).

Conclusion

The Cochabamba conurbation waterscape has long been fragmented, not only at a territorial level, but also in relation to the rights under which water is accessed and distributed, and the organizations that participated in its construction. Looking at the conurbation history, we can see that the current irrigations and potable water systems in the Cochabamba valley are based on an accumulation of different rights and systems (Crespo Flores et al., 2004, pp. 44–45).

The role of the state has for a long time not been dominant in this waterscape. State institutions, here often territorialized by municipal authorities, have inserted themselves in a pre-existing landscape, and have long been forced to negotiate with rural and 'informal' actors to access water-sources, and to take its place within the valley territory. This chimes with general difficulty of the Bolivian state in controlling and exercising its authority on the national territory.

The municipalities, and the municipal water systems, have often attempted to create a 'modern' and 'formal' landscape and waterscape, but have in fact used informal means of expansions. In the last year, the state discourse has changed, although the actions of the government seem to continue the long-term effort of the state to control and 'order' the waterscape of the Cochabamba valley, to make it legible and knowable to a modern state bureaucracy. These efforts are the centre of the tensions emerging between the state and communitarian providers, which will be analysed in more details in Chapters 5 and 6.

Furthermore, this chapter emphasizes the importance of very local organizations and systems of rights to understand the Cochabamba waterscape. The history of struggles and relations that shaped the way in which Cochabamba peri-urban inhabitants conceive and created their waterscape will be analysed in more details in Chapter 4.

3. Methodology

Introduction

This chapter critically analyses the way in which I conducted my research. I explore how I started my fieldwork and formed relationships with my informants. I discuss the methods used with different kind of actors and their relevance to my research question. Additionally, I explain how I answered some ethical problems and the way in which the collected data were analysed.

The objective of this thesis is to understand how cooperatives influence water governance in the conurbation through an analysis of the waterscape on different scales and different spaces. I argue that the basis of the cooperatives' power comes from their connections to their territory. Furthermore, the points of view of the state, the cooperatives and other actors contribute to shaping the waterscape on different scales. It is important to frame such perspectives as part of the methodology of this thesis. For these reasons, my methodology strategy was two-fold. On one side, I interviewed state officials and cooperative representatives to understand how they view and act on the waterscape. On the other side, I deepened my understanding of how the cooperatives build and conceive the waterscape by performing two in-depth qualitative case studies. Mapping exercises were also undertaken on different scales and across different spaces, as they allowed me to better examine the relationship between cooperatives and the wider waterscape, as well as their interaction with other actors.

Data analysis also reflected the complexity of this multi-sited and multi-scalar research. Interviews with state officials and cooperatives, as well as interviews related to the two case studies, were first analysed separately. This allowed me to explore how my respondents saw their cooperative and governmental organizations, the respective roles of their organizations and their relationships. It allowed me to analyse the reasons for the differences and

similarities between the two case studies. Afterwards, I focused on certain infrastructural projects in the conurbation, which are expected to modify the material waterscape. Analysing how the state and communitarian organizations viewed and participated in these projects offers a clear example of how cooperatives can contribute to water governance. This method of analysis allowed me to better understand how scale, waterscape, power and ideal hydro-social territories shape water governance in the conurbation.

3.1. The necessity of multi-scalar, mixed methods research

The aim of this thesis is to understand how cooperatives influence water governance. The reasons for the choice to examine Cochabamba water cooperatives is detailed in Section 1.3. This section discusses the necessity for a multi-scalar investigation (Chowdhury et al., 2011) and offers an overview of my mixed methods qualitative approach. My previous knowledge of the situation in Cochabamba (see Section 3.2), together with a review of the literature on the Cochabamba situation (e.g. Bakker, 2007; Bustamante, 2004; Crespo Flores, 2000; Crespo Flores et al., 2004; Shultz and Draper, 2008) informed my research design. The research design includes in-depth case studies of two different cooperatives and multi-scalar interviews with the state, cooperative respondents, and expert respondents.

Investigating water governance in the conurbation requires an in-depth understanding of the cooperatives both as a whole and as single entities. I was particularly interested in examining how cooperatives are embedded in the wider waterscape. As mentioned in Chapter 2, the conurbation's development was disorderly, which determined a high variability in water access and organization in the outskirts of the city (Zegada et al., 2015, p. 5), where state provision is often absent. Therefore, it was important to have an overview of the role that the cooperatives assume in the conurbation. To this end, I interviewed the representatives of most water cooperatives active in the Cochabamba conurbation, both before and during my case study. This helped me to select the two case studies. At the same time, themes emerging from my case studies helped me to refine my questions for the representatives of the conurbation cooperatives, and vice-versa. To answer these questions, I also carried out a

round of re-interviews. In this way, I was able to understand the differences and similarities in their approaches towards the state. I was also able to understand how they influence and are influenced by the wider waterscape of the conurbation. The use of open-ended interviews allowed me to address specific issues, while allowing for the expressions of differences in experiences, unique difficulties and relationships with the waterscape, as well as the emergence of new themes.

After 7 months from the beginning of my research, I selected two case studies (the method of selection is detailed in Section 1.5) to explore the various facets of a cooperative life (Somekh and Lewin, 2004, p. 33), such as the motivation behind the cooperatives' behaviour, the formal and informal interactions between actors, and cooperatives' organizational, material and economic characteristics (Bryman, 2008, p. 62; Hakim, 2000, p. 63). The horizontal power structures of the cooperatives, namely the importance of democratic members participation, means that the analysis of the cooperative's decision-making process must include the understanding of the visions and the interactions of the members with the cooperative. Furthermore, participant observation allowed me to contextualize data collected in other ways (Kawulich, 2005), including a 'geographical' context, as I could observe and analyse the 'material' waterscape of the cooperative and the way it influenced my respondents. Therefore, the mixture of interviews, participant observation and document analysis that characterize a case study were best suited to understand how the cooperatives see themselves and the state, and their relationship with a specific local waterscape. As explained later, these elements are key to the relationship of the cooperatives with the state and the way in which the cooperatives shape the waterscape.

Interviews with state officials were necessary to understand how the state influences water governance and the cooperatives. The state is a central actor shaping the waterscape, and it is crucial to highlight that this is through both its action and its inactions. I used open-ended in-depth interviews to allow for detailed discussions on the context in which the cooperatives operated allowing me to obtain preliminary information on a situation on which I initially had a limited knowledge (Goldstein, 2002, p. 699). Interviews carried out late in my fieldwork also allowed me to ask specific questions and to obtain information that were not available elsewhere. Open ended interviews also allowed the expression of beliefs and visions. I conducted interviews at different levels of the state, as each level has different functions and may have different visions, underlining therefore importance of scalar

analysis. As a result, state organizations at different levels influence water governance differently and need to be analysed as a whole to understand how water governance is created in the conurbation.

Another dimension of this research is the analysis of how different cooperatives collaborate in the conurbation. In Cochabamba, such collaboration happens mainly through an umbrella organization, the Federation of Water Cooperatives of the Cochabamba Department (FECOAPAC). Such organizations are important mediators between communitarian organizations and the state (e.g., in Cochabamba the Federations of Irrigators and ASICASUDD-EPSA; for an international example see Appadurai, 2001). They are also a way through which the communitarian organizations are able to exercise power. As I demonstrate in the following chapters, FECOAPAC plays a crucial role in propagating the cooperatives' alternative vision of how the waterscape should appear. Therefore, FECOAPAC became a fundamental site of study. This organization was examined through open-ended interviews with its leaders, as well as participant observation in some of the cooperative leaders' meetings and activities.

3.2. Entering the field

This section describes what I did when I first arrived in Cochabamba and how I first was able to create connections with certain organizations. Before leaving for Cochabamba, I re-established a connection with the Italian NGO Ce.V.I., with whom I was in contact due to my master's thesis project in 2009. The NGO updated me on the situation in Cochabamba and informed me about the nuances of water cooperatives. They had such information because they were collaborating with one cooperative to build a wastewater treatment plant (WWTP). My contact with Ce.V.I. was a useful point of entry for my research and allowed me to make contact with other key stakeholders/organisations in the wider waterscape. Upon arriving in Cochabamba, the head of the cooperative collaborating with Ce.V.I. put me in contact with FECOAPAC.

After discussions with the leader of FECOAPAC, observing a couple FECOAPAC meetings and conducting exploratory interviews with the heads of a few cooperatives, I confirmed that

the cooperatives were an interesting case study. Some key characteristics determined this decision. First, the cooperatives are placed throughout the conurbation, allowing me to better understand their interaction with the overall waterscape in the conurbation. Second, a majority were well-established institutions with a long history, thus allowing me to have a better historical perspective. However, a few were in marginal areas with problematic water access, thus allowing me to understand the different strategies that they employed to shape their waterscape and their relationship with the state. Further details are given in Section 3.3.

3.3. Water cooperatives and FECOAPAC

This section justifies choosing water cooperatives as a case study and analyses their relevance to the research question. Furthermore, the section explores and justifies the themes investigated in the interviews conducted with the cooperatives and FECOAPAC and describes ulterior research methods utilized. A few details on the interview process are also given to analyse their influence on the data obtained.

Cooperatives are a minority amongst the communitarian water providers in the conurbation. There are approximately 30 cooperatives out of the 600 communitarian water providers overall. Water cooperatives tend to be larger and to give better service than other communitarian organizations in the conurbation (Lavrilleux and Compere, 2006, p. 21). However, water cooperatives are not qualitatively different from other communitarian organizations. They are officially registered as cooperatives, but their internal organization and the participation of their members is similar to that in other communitarian organizations. Differences are due to the fact that those communitarian organizations that decide to register as cooperatives are mostly well-established ones (as discussed in more detail in Chapter 4).

One key facet that justifies my selection of water cooperatives as a subject of study is that they are spread throughout the conurbation's waterscape. Consequently, I could, through an analysis of cooperatives in different municipalities, understand which elements of the cooperatives' interaction with the state are particular to their municipalities and which elements have wider causes. Furthermore, the distribution of the aquifers in the conurbation

means that water quality and availability vary significantly. As a result, I could study the influence that the distribution of water sources in the waterscape has on the cooperatives, as well as how the power of the cooperatives influences their capability to access water. The need to access water sources is a key driver of the way in which the cooperatives interact with other state and non-state actors.

I carried out interviews with 21 of the 25 cooperatives I was able to pinpoint in the conurbation. Cooperatives are also key to understanding the dynamics of the Cochabamba waterscape for four key reasons. Firstly, most of them are well-established and relatively longstanding (founded approximately 20 to 30 years ago) so offer a window into wider patterns of urban development over time such as informality, auto-construction of neighbourhood organizations and the physical evolution of the waterscape. Secondly, they invite an analysis of the consequences of different state water policies through time. Thirdly, cooperatives are not uniform, and some are more fragile organizations, located in more marginal, poor areas. Understanding how this fragility changes their relationship with the state is important. Finally, the variability between cooperatives offers understanding of how class, access to water and the age of the neighbourhood influences and is influenced by the continuous development of the waterscape.

My research question requires me to undertake a detailed analysis of how the cooperatives influence and are influenced by the waterscape on different scales. I completed open-ended interviews with representatives of the cooperatives and FECOAPAC. FECOAPAC is an umbrella organization with a central role in representing the cooperatives to the state, and therefore, a fundamental facet of the way in which the cooperatives influence water governance. As a result, the FECOAPAC relationship with the water cooperatives and with the state is of significance in this study. The constitution of networks is a fundamental way in which communitarian organizations relate with the state in Bolivia. The analysis of FECOAPAC allows me to understand how this network is used specifically by communitarian organizations to exercise power in the waterscape.

My interviews, although open ended, investigated four broad themes. Firstly, I probed the cooperatives material waterscape, as well as their formal organization. This allowed me to collect empirical data, perform comparisons and extract an overall view of the cooperatives.

The second theme concerned the way in which the cooperatives obtained their resources: access to water sources, infrastructures or organizational capabilities. Such themes explored the history of the cooperatives, which are the basis of their discourse regarding themselves and their place in the conurbation. Oral histories are regarded as instances of storytelling (Skinner, 2014, p. 14). This made them appropriate for the goal of this thesis as I aimed to understand what these 'stories' meant for the interviewees and the way in which these histories influenced their relationship with the cooperatives. History also provides a link between the local cooperatives' history and the history of the conurbation. The third theme regarded the cooperatives' relationship with their members and water users. This relationship is the basis of the cooperatives' capability to control their territory and to exercise power at different levels. The fourth focus of the analysis is the relationship between the cooperatives and the state. Questions on this subject allowed me to analyse both how the current relationship is interpreted and how representatives of the cooperatives think that relationship should be.

I conducted multiple interviews with the leaders of FECOAPAC, as well as various informal chats in their office. This allowed me to understand how FECOAPAC reacted to issues that arose at that time (Lecompte, 2002, p. 286). These issues concerned clashes between the state and the cooperatives and wider issues arising in the conurbation waterscape or state water-related policies. I also observed various public meetings between the cooperatives and FECOAPAC. The observation of these meetings added to my understanding of the relationships between FECOAPAC and the cooperatives and various tensions that arose. Additionally, I learned how cooperatives participated in FECOAPAC decisions. Furthermore, state policies and the relationship between the cooperatives and the state were often discussed in these meetings, allowing me to understand how these issues were addressed, interpreted and conceived by the cooperatives. Finally, I spent time in the FECOAPAC office. As a result, I was also able to observe informal interactions between cooperative representatives and FECOAPAC officials and to understand the main issues the cooperatives brought to the FECOAPAC's attention. In addition, FECOAPAC had a variety of official documents on the cooperatives, which added to my factual knowledge base.

The analysis of FECOAPAC offers detailed information on a fundamental institution, used by the cooperatives to interact with the state. Therefore, questions posed in the interviews were focused on how the relationship with the state occurred, how the state reacted to the

federation's requests and what their main requests were. I also analysed how the relationship between FECOAPAC and the cooperatives evolved, as certain tensions were present. Consequently, FECOAPAC is not the only avenue through which the cooperatives influence water governance, nor can it be expected to faithfully represent the different visions of all cooperatives towards the state.

Performing these various methods of analysis had its challenges. Foremost, FECOAPAC was crucial to my capability to contact the cooperatives, as no official listing of these organizations are present nor are their contact details available. The president of FECOAPAC agreed to put me into contact with their members and grant me access to the documents in their possession. In exchange, I was asked to prepare a database containing information on the cooperatives, as FECOAPAC itself did not have these data in a systemized form. These difficulties and exchanges underline the importance of information in the conurbation.

I considered the ethical implications of collecting data for FECOAPAC (further details are in Section 3.6). I decided to prepare two separate interview guides aimed at presidents of cooperatives: one was a questionnaire to collect the data I needed to complete the database (but that also gave me a factual base of information); the other was compiled for my own research. The data requested by FECOAPAC were mostly factual, such as data concerning water sources, infrastructure, prices and projects, as well as bureaucratic data (translation of the questionnaire can be found in Appendix 1).

Writing an effective interview guide for my dissertation required me to collect some information. In the first months after contacting FECOAPAC, I was invited to observe various workshops, given by a Bolivian NGO with 10 water cooperatives. Observing these workshops and listening to the discussions that ensued helped me understand some of the cooperatives' concerns and the background in which they operate. This first exploratory study allowed me to better create an appropriate interview guide (Monti et al., 2014, p. 138). I tested the interview guide with the president of the cooperative Quintanilla, whom I met at a workshop, and I sought the opinion of the president of FECOAPAC (a translation of the final interview guide can be found in Appendix 2).

In November, I started my first round of interviews with the cooperatives. I used a list of phone numbers that FECOAPAC provided me to ask potential informants for an interview. One of the main difficulties, once I managed to secure an appointment, was finding the cooperatives' offices. In many cases, I could not find their locations beforehand as I did not have a precise map, and in some cases, the streets had no official names. While this was a problem in practical terms, it also allowed me to observe the ways in which distance from the city centre and scarcity of public transportation are often linked closely to poverty and marginality, as well as to scarce water access.

Furthermore, I started to understand how the city was often unmapped and unknowable. These themes emerged from the literature and from interviews with state officials, and I could observe what this meant in practical terms, both regarding the difficulties of the inhabitants and the difficulties of the state in understanding the conurbation. This also led me to start mapping the water providers, which was difficult because official maps were often incomplete.

Generally, interviewees were open and friendly, but a couple were slightly suspicious, especially concerning the FECOAPAC survey. Cooperatives have to pay a fee to FECOAPAC that depends on their number of members. The president of one cooperative told me that the reason that FECOAPAC had sent me with the survey was to check up on their number of members. He had no problems, however, giving me an interview, as he perceived me as non-involved. He thought that FECOAPAC was using me without me realizing it and even agreed to answer the FECOAPAC's questionnaire.

While I did not think that FECOAPAC was using me to 'spy' on the cooperatives, this exchange underlined a tension between a few cooperatives and FECOAPAC, which I observed on further occasions. To avoid any ambiguities, therefore, I always kept the questionnaire and the interview guide separate, and I always made it clear what information would be passed on to FECOAPAC and what would be used exclusively for my PhD research. I also made it clear to the head of FECOAPAC that I would not give him full transcriptions of the interviews, only the completed database.

In total, I was able to interview representatives of 21 of the 25 cooperatives registered in the FECAOAPAC database as acting in the conurbation, as well as two cooperatives that operate in more distant municipalities (a complete list of interviews can be found in the Appendix 6). As new themes emerged during my research, I also performed a round of re-interviews in eight cooperatives towards the end of my research. The interviews usually lasted from a minimum of 30 minutes to nearly 2 hours. Overall, the interviewees had a high level of knowledge about their cooperatives or were able to obtain specific information from other people.

While my research question focuses on water governance on the urban scale, such governance is also influenced by actors at the central state level and, more generally, by national trends, policies and issues. Therefore, I conducted one interview (and one re-interview) with the president of the National Federation of Water Cooperatives (of which the FECOAPAC is a member), an organization based in Santa Cruz de la Sierra, where the largest water cooperatives of the country are based. I also interviewed the representatives of three cooperatives acting in Santa Cruz de la Sierra, as well as two representatives of water cooperatives operating in La Paz. This was useful to understand how the Federation of Cooperatives acts on a national scale and how certain issues affect the cooperatives throughout the national territory. Furthermore, I was also able to observe how the relationship between state and cooperatives are radically different in Santa Cruz de la Sierra from the one between the state and cooperatives in Cochabamba. This offered insight into the ways in which power relations influence the relationship between state and cooperatives which is spatially variable within and across the conurbation (see Chapters 5 and 6)

3.4. Interviews with state officials

This section explores how interviews with state officials were carried out and how they relate to my research question. The state is a fundamental actor in urban water governance. Therefore, an analysis of the role, policies and visions of state officials is necessary to understand how the state affects the waterscape. In my analysis, I focused on five themes necessary to answer my research question. These themes are the main ways in which the state affects the waterscape.

First, I explored how the state materially modifies the waterscape in the conurbation through large-scale infrastructural works. Such works assume a central importance in water governance in the conurbation, as they strengthen the role of the state and often push water governance to a higher geographical scale. An example of such a project is the Misicuni dam (explored in Chapter 6). Such projects have an important influence on the relationship between the state and the cooperatives.

Second, the state influences the waterscape through the direct provision of water and sanitation services. Within the context of the state organization, direct provision of the service is the municipalities' responsibility. In the conurbation, tensions between the municipal water providers and water cooperatives became a key element of my analysis. This element allowed me to understand how municipalities and cooperatives often compete over the control of the territory. As mentioned and further explored in later chapters, control over the territory is a key element through which the cooperatives exert power. Furthermore, the contrast between the concept of universal municipal provisions and communitarian provisions represents one of the main clashes between state and communitarian organization discourses on the way in which water governance should be organized. I have, therefore, studied the discourses provided by the municipalities, both on their services and the services of the cooperatives, as well as their material consequences.

Legislation and regulation of the water and sanitation sector are a third important focus of the analysis. Regulations are one of the ways in which the state influences water governance. In Cochabamba, one of the most important regulations concerns the formalization of water providers, which was occurring at the time of my research. Analysis of this process and of the difficulties it encountered allowed me to understand how such regulations expand state control and their knowledge of communitarian organizations and how communitarian organizations react to such attempts of control.

Fourth, I analysed the way in which the state distributes resources (i.e. funding) for water and sanitation projects. The analysis of this topic is important for three reasons. First, the distribution of resources concretely underlines the state's priorities (Monti et al., 2014, p. 138). Second, the rights of the cooperatives to receive state support is a fundamental point of contention in Cochabamba, as most municipal officials declared that the cooperatives are

not legitimate recipients of state funding. Third, this topic allowed me to pinpoint the existence of different discourses towards the cooperatives at different levels of the state. Such discourses could be used by the communitarian organization network to influence water governance in the conurbation.

The fifth topic focuses more abstractly on how the state sees, conceives and imagines the waterscape. An indication of these conceptions and discourses emerged throughout all precedent topics; however, I also treat these conception and discourses as a separate topic of analysis. To this end, I asked state officials about their perception of the respective roles of the state and communitarian organizations in providing the water service. Such perceptions have material repercussions on the relationship between cooperatives and the state and on how the state influences water governance.

I used these in-depth interviews to adapt to the high variability of roles and expertise of my respondents. I also added probing questions tailored to the expertise of my interviewees (Dexter, 2006, p. 17). These interviews were conducted with officials working at all levels of the state. This variation was necessary to obtain a complete view of how different levels of state influence water governance in the conurbation. In addition, different state actors may have different policies and visions regarding water governance.

A figure illustrating the various levels of the state involvelvement in water and sanitation provision is synthesized in Figure 3. Interviews were carried out with representatives of most of these institutions (a list of the interviews can be found in Appendix 9).

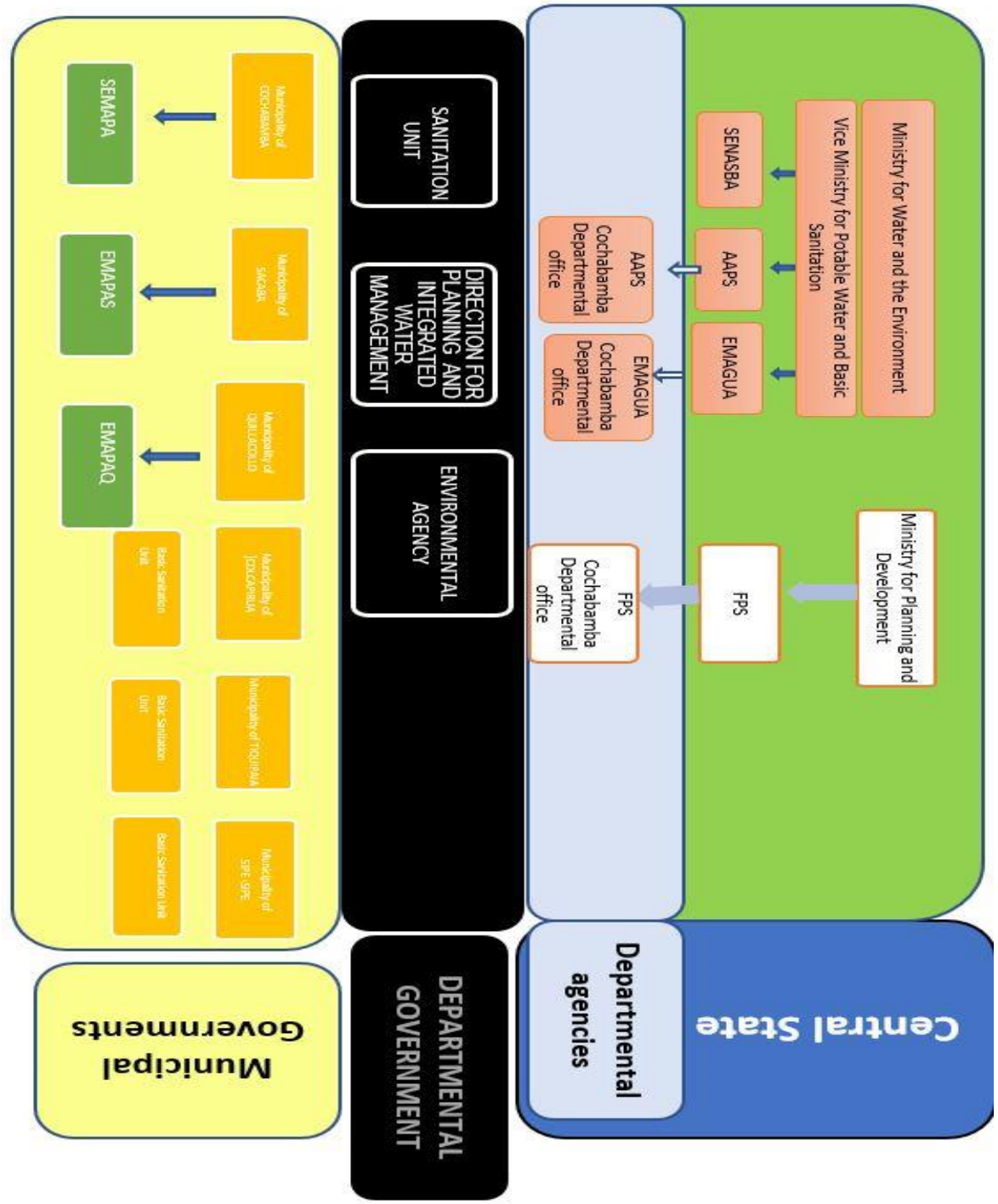

Figure 4: Scheme of state organisations related to the water sector. I developed this scheme from an analysis of the data gained during interviews, consultations of state documents and official websites (http://www.mmaya.gob.bo ; https://www.fps.gob.bo/).

At the end of my research, I had completed interviews with 44 state officials, at the municipal, departmental and national state level. Since my main aim is to understand the role of communitarian providers in water governance, issues that arose from my research with the cooperatives were used to formulate new questions, which were asked to state officials. I, therefore, re-interviewed 10 of these officials towards the end of my fieldwork. Interviews with state officials were thus used continuously during the research to create a context allowing me to guide my research (Denitch, 1972, pp. 766–767; Goldstein, 2002, p. 699) to understand their views and opinions and to understand specific issues on which they were experts (Mikecz, 2012). At times, I was given suggestions about whom I should interview (snowball sampling). Interviews lasted between 30 minutes and 2 hours, depending on the topic and the time my interviewees had.

Apart from state representatives, I performed a series of interviews with representatives of NGOs, consultants and academics. The themes of these interviews were similar to those explored with state officials. In-depth interviews enabled me to ask probing questions related to the interviewees' areas of expertise. I completed 18 interviews with such respondents.

3.5. Selecting the case studies and exploring their waterscape

The reason I chose an in-depth case study, using a mixed methods qualitative design, is explained in Section 3.1. In this section, I explain why I selected two specific cooperatives placed in the same district. I explore how their characteristics allowed me to answer my research question. This section, furthermore, explains my decision to undertake a wider analysis of the district's waterscape, as well as why this analysis contributed to answering my research question and how I carried out my research. Finally, such information is important to assert the quality of the data collected and the data's implications on my research.

A multi-sited case study coupled with a scalar research design allows for fruitful comparisons (Chowdhury et al., 2011). I chose to examine two cooperatives due to time constraints. Choosing more case studies would have negatively influenced the quality of the data obtained. The decision to analyse two cooperatives placed in the same district was made for various reasons. First, this choice allows a more in-depth understanding of the wider waterscape in which these cooperatives were placed, as case studies should be generally be placed in a wider context (David and Sutton, 2011, pp. 166–167). This includes the understanding of other communitarian and non-communitarian actors, the influence of state organizations and the material waterscape, such as water sources and infrastructures. Furthermore, I could better study the effect of the policies of the cooperatives' municipality. Such in-depth study would have been difficult to replicate in more than two different areas. Furthermore, I carried out my research in the two cooperatives in the same period. As their offices were a short bus ride away from each other that allowed me to spend time each day in both cooperatives. However, there were not only practical reasons for this choice. The fact that both cooperatives are placed in the same landscape and are related to the same municipality also allows me to compare them. I was able to understand what issues were due to the cooperatives' characteristics and which were more generalized issues present in the region.

I decided to perform my case studies in two cooperatives that had different characteristics: San Pedro Magisterio and Quintanilla. These characteristics, described below, have important consequences on how the cooperatives control their waterscape and relate to the state. Furthermore, these characteristics are widespread in the conurbation cooperatives, thus allowing me to establish a correlation. I verified those characteristics, as well as how widespread they were, using the interviews I completed with cooperative leaders.

It is generally difficult to generalize the results obtained through case studies (Bryman, 2008, p. 57). However, the usage of a multi-scalar research method enables me to analyse how some themes and issues emerging from the case studies are reflected in the wider conurbation. It was possible for me to investigate issues emerging from the case studies in the wider conurbation and vice-versa. For example, I used some themes emerging from my case studies to introduce new questions in the interview guide for cooperative leaders in the wider conurbation and for state officials.

The Cooperative of Water and Sewage San Pedro Magisterio Ltda. had characteristics with important consequences on the way in which its members control their waterscape, exercise power and develop their relationship with the state. These characteristics are widespread in Cochabamba cooperatives. Most cooperatives in the conurbation, in fact, are small, self-contained, located in well-established neighbourhoods and receive water from wells placed in their own territory. This is also the case for San Pedro Magisterio.

The relationship with their members is key to how cooperatives exercise power. As explored in Chapter 4, small, established cooperatives located in well-established neighbourhoods see a decrease in the involvement of their members over time. This has consequences for their relationship with the state and control of the waterscape, as is explored in Chapter 4.

Moreover, obtaining water from water sources placed in their territory has important consequences on the cooperatives' relationship with their neighbouring actors. While those with water sources outside their territory have a stronger need to exercise power outside that territory, San Pedro is less vulnerable to external forces. Both characteristics are important for the cooperatives to exercise power in the local waterscape and in their relationship with the state.

Furthermore, the project for an independent wastewater treatment plant was being implemented at the time of my research. This plant represented an alternative model to the large-scale solutions for water pollution presented by the municipality. This represents an example of how cooperatives can present a different model of water governance, as well as how they can resist the power of the state.

In contrast to San Pedro, the Cooperative of Water and Sanitation Quintanilla Ltda. is a large water cooperative (the largest in the conurbation), with most of its water sources placed outside its area of service. There are fewer cooperatives that obtain water in this way, but this fundamental difference from San Pedro allowed me to examine different ways in which cooperatives interact with their waterscape and external actors. To control its water sources, Quintanilla needs to create a network of agreements with different actors. These networks

are a fundamental strategy for the relationship between communitarian organizations and the state.

The need to access and maintain infrastructures and water sources placed outside of their territory would require more active member participation. However, Quintanilla's large size and fast growth means that its link to its members, especially newer ones, is often weak. This allowed me to more deeply examine the importance and nature of member participation for the capability of the cooperatives to build, maintain and modify their physical waterscape and to engage with the state as well as the consequences of a decrease in participation.

To understand the operation of these cooperatives and their interaction with the municipality, it was necessary to put them in the context of the District 2 waterscape. This allowed me to better understand the relationship between the cooperatives, state and non-state actors in a local way. The district presents a network of water rights and organizations due to its ex-rural history. This district has long received water from mountain sources managed by the irrigators' organizations. Some of these sources are now used by the cooperatives because of several agreements with different actors that developed over time. This allowed me to place the development of the cooperatives in the history of the district, of the conurbation and of the Bolivian state, as national, local and regional changes affected the district waterscape.

Furthermore, the district hosted a high number of independent water providers. The district presented the higher concentration of water cooperatives in the conurbation (seven cooperatives), but it also hosts water committees, gated communities with independent water systems and systems administered by the OTBs (Grassroots Territorial Organizations). While this thesis focuses on the cooperatives, the study of this district allowed me to engage with different providers, enabling me to grasp the variability in water provision in the conurbation. Furthermore, there was a growing influence of the municipal water service in the district. This service's expansion in the district allowed me to analyse the tensions produced by the state's growing control over the waterscape, as well as how its relationship with the cooperatives evolved and how municipal politics influenced this expansion. Furthermore, at the time of my research, the municipality planned to build a large-scale wastewater treatment plant to serve the district. This plan created tensions and conflicts that

can be better understood if placed in a district-wide context. These tensions were fundamental to my understanding of the way in which the municipalities are expanding their control over the conurbation waterscape and of the discourses employed to justify such expansion. Therefore, I was able to observe how communitarian organizations perceived and responded to pressure to connect their sewage system to the municipal plant.

3.5.1. Mapping District 2

My analysis of District 2 was based on a mixed methods approach. The district is now a largely urban district, however information over it were still not complete. Centrally the municipality did not have a clear idea about the position and conditions of the networks operating in the district, except for what regarded the networks managed by the municipal provider. For this reason, the district waterscape was only partially mapped. My first step was, therefore, the attempt to map water providers in the district, to obtain a complete view of its fractured, but still interlaced, waterscape.

To this end, I obtained a detailed map of District 2, hired a taxi and set out to explore the district. For three days, I stopped at every water tower and asked people who was the water provider in their territory. The cooperatives were the easiest to locate since they had offices and employees (and I had already interviewed some of them). Other providers were more difficult to find and often required consulting private citizens. During these first trips, I collected basic information on every water provider I could locate. Furthermore, I asked the respondents to colour their area of service in the map, both because I was setting out to create a map of the water provision in the district and to understand what water providers were missing. Because of the information collected, I managed to obtain an outline of the water providers located in the sector. One of the maps that resulted from this research is displayed below.

Figure 5 Water provider of District 2 Sacaba (partial). Base map: Planning Unit of the municipality of Sacaba. I draw the areas of services of the District water providers using data coming from interviews.

After this first exploratory foray into the district, I performed in-depth interviews with representatives of various water providers in the district. At the end of my field work, I had completed in-depth interviews with representatives of 13 water providers (excluding the representatives of the seven cooperatives I had already interviewed) and had obtained basic information on five more providers. I also conducted interviews with representatives of other state and non-state actors of District 2. This allowed me to gain a more complete understanding of how these actors interacted, collaborated and clashed to shape the district's waterscape. Therefore, I interviewed the deputy mayor of District 2 (twice, as the post-holder changed three times while I was there), the president of the Association of OTBs of District 2 and the head of the Association of Irrigators. I was also able to observe two assemblies of the Association of OTBs of District 2. These interviews and observations were particularly useful in helping me understand how municipal funding was distributed in the district, as well as the relationship water providers maintained with the municipality and with the OTBs. I also gained a general idea of the power relations within the districts and of the actors involved in certain issues.

3.6. The two case studies

The necessity for an in-depth case study and the selection of the two case studies were analysed in the previous sections. This section explains what methods were used to collect data in my two case studies, what kind of data these methods allowed me to collect, and what challenges I faced in the two cooperatives. The aim of this section and the two following sub-sections is to establish the quality of the data collected, as well as explain how the data allows me to answer my research question.

In both cooperatives, I performed in-depth interviews with the employees and members of the cooperatives' boards of directors, as well as with other notable representatives of the cooperatives and representatives of the OTBs. Such interviews touched on various themes, which were fundamental for my research, and allowed ample space for new themes and issues to emerge. The themes discussed were broadly the same ones discussed with the head of cooperatives in the conurbations (described in Section 3.3): the history of the cooperatives; their infrastructural, organizational and economic activities; their relationship with their members; and their relationship with external actors. However, such themes were developed more deeply and connected with the context of the case study. Most of the interviews were usually quite long, ranging from one to two hours. Some of these interviews were repeated multiple times and in informal occasions, sometimes taking the form of more unstructured interviews or conversations, which are appropriate in the context of participant observation (Greene, 2012, p. 211).

I also performed a series of interviews with water users. My interview guide aimed to understand how the cooperatives evolved and how the users saw and interpreted the cooperative history. I also analysed the water users' level of satisfaction with the service and with the water prices. I additionally explored the way in which they related to and participated in the cooperative and the way in which they wished to participate (or not to participate). A translation of the interview guide is included in Appendix 4. These interviews allowed me to explore the relationship between the members and the cooperatives and the reason for the shape this relationship took. Such interviews were more variable in their length. Some interviewees had scarce knowledge of the cooperatives or were in a hurry, so those interviews were quite short (around 15 minutes). However, some interviews, especially

those conducted with older users, took a longer time (between 30 minutes and 2 hours). This might be a consequence of the free time available to retired interviewees, but it also seemed to be a sign of their more intense relationship with and knowledge of the cooperatives.

I completed 53 interviews for the case study of San Pedro Magisterio. Eleven were with members of the board of directors and employees, one with a member and one with an ex-member of the board of directors of the OTB, 42 with water users, and four with inhabitants of areas near borders of the cooperatives, which had not received the service (for reasons explored in Section 3.6.1).

In the case study of Quintanilla, I performed 69 interviews: nine with members and ex-members of the board of directors, four with employees, 48 with water users, one with a non-user (that was requesting the water service), and seven with representatives of OTBs and gated communities receiving the service from the cooperative (counting only those not also part of the cooperative's board of directors)[10].

In both cooperatives, I also completed participant observations which took different forms during my field work (explored in Section 3.6.1 and 3.6.2). These observations gave me a general idea of the cooperatives' day-to-day activities. Also, the information I received informally during my stay in the cooperatives helped me to write relevant and appropriate interview guides. In addition, the experience of sharing moments in the life of the cooperatives helped me to contextualize the data I received through interviews and to compare what I was told with what I observed. During these instances of participant observation, I took some photos and kept field diaries.

I also observed some notable events in the life of the cooperatives and of the district. I observed two general assemblies of the cooperative Quintanilla[11]. I also observed the various festive activities, with which the cooperative members were involved. Such celebrations

[10] Five of these are also the heads of independent water providers, which receive only the sewage service for the cooperatives and which were therefore also counted in the list of water providers interviewed. In this case, I would interview them both as water providers and to understand their relationship with the cooperative.

[11] I was not able to observe any general assembly of the cooperative San Pedro, as only one took place during my research and, at the time, I was out of the country.

allowed me to better understand the material and symbolic place that the cooperatives occupied in the district.

In the cooperative San Pedro Magisterio, I observed various meetings, internal and external, concerning the project for the construction of a wastewater treatment plant to be completed in the cooperative. I also participated in celebrations connected to the start of the plant construction. During these events, I was able to observe the relationship between state officials and the cooperative members, as well as between cooperative members.

My research followed similar (but not identical) lines in both cooperatives. My experience in working with them, however, was different. Therefore, I will give separate detailed accounts of what occurred in the two cooperatives.

3.6.1. San Pedro Magisterio

This section presents relevant information about the methods used to collect data in the case study of San Pedro. My case study in the cooperative San Pedro took place between May and August 2014. Towards the end of April, I met with the president of the cooperative to ask his permission to conduct my research. He was quite open to the idea. In exchange for his collaboration, he asked me to write a report on the users' perception of the cooperative so that they could address the most important issues. I finished the report and sent it by email a few months after the end of my field work. The ethical issues entailed are discussed in Section 3.7.

At the start of my field work, the president invited me to a board of directors meeting to introduce me to the other members. They were quite welcoming, and I could immediately arrange a time and place to interview most of them. Most were older people (over 60 years old) and had been founding members of the cooperative. They were, therefore, quite knowledgeable and keen to speak about the history of the neighbourhood and of the cooperative.

In May, I started to frequent the cooperative office multiple times per week. I was given full access to internal documents and was openly told about all the news (and gossip). I spent time in the cooperative's front office and chatted with the employees. This allowed me to understand the day-to-day work of the cooperative, to discuss occurrences and to sound out some of my interpretations. I also explored the neighbourhood, walking and talking with the plumber. This allowed me to gain a deeper understanding of the cooperatives' material waterscape, as well as to how the neighbourhood had evolved and was currently changing. Such understanding of the evolution of the material waterscape is crucial to understanding the relationship between the cooperative and the territory and their potential problems, as is further analysed in Chapter 4 and 6. During our walks, the plumber also introduced me to various cooperative members, asking whether they would like to be interviewed. I believe that the fact that I was with the plumber, who was well-known and generally well-liked in the neighbourhood, put most people at ease.

Water users were generally open to speak about the cooperative. I usually waited in the front office and asked the users, who would come in to pay their water bills, for an interview. A significant number were retired and had time to chat and much to tell about the history of the cooperative and of the neighbourhood. Some of the younger inhabitants were quite busy and had no time for long interviews. I tried, however, to differentiate the interviews as much as possible in terms of where the water users lived in the cooperative's territory, whether they were new or old users and whether they were members or only users, as it soon emerged that these elements influenced their relationship with the cooperative (as discussed in Chapter 4).

To better understand the relationship between the cooperative and its territory, I also examined its relationship with the OTB. This research led me to uncover tensions within the OTB. I also determined how these tensions were connected with the inclusion and exclusion of parts of the neighbourhood from the water system. The examination of these tensions and exclusions allowed me to understand how the strong connection of the cooperative with one waterscape both strengthened the cooperative's connection to its members but also led to exclusionary effects. To say: the cooperative did not provide water to those that saw as not belonging to its community. A discourse given by the state is that this exclusion is a sign of the cooperative's weakness and inefficiency, thus causing consequences regarding its relationship towards the state. To analyse these issues, I interviewed those involved in the

tensions concerning the OTB. To more deeply examine the consequences of exclusion of parts of the neighbourhood from the water service, I interviewed some of their inhabitants, including some who received the water service from the municipal provider. Further details are given in Chapter 4.

As mentioned, the fact that the cooperative had a project to build an independent wastewater treatment plan was one of the reasons I selected it as a case study. I followed the project quite closely, for reasons detailed in Section 3.5. I observed internal meetings, press conferences and celebrations. I also included questions on the construction of the plant in my interviews with water users and cooperative representatives.

I collected various documents held by the cooperative, which allowed me to support and complement the data collected through observations and interviews. In particular, I was able to access the *libros de actas* of the cooperative: hand-written books where a cooperative transcribes what happened during meetings of the board of directors and general assemblies. These documents were of extreme importance to me as I could not observe either assemblies or the directors' meetings directly. I was also provided financial and technical data.

3.6.2. Quintanilla

I conducted my research with the cooperative Quintanilla in the same period as the one in San Pedro: from May to August 2014. I interviewed members of the board of directors, employees and water users. I also observed public events and accompanied an employee on his round to take readings of water metres. Additionally, I went with some members of the board to observe the reparation work of a broken pipe in the mountain and was shown part of the infrastructure that brings water from the mountain range.

Overall, performing my research in Quintanilla presented more challenges than in San Pedro. It took me much more time to gain the trust of the cooperative representatives, and I was never given the same access to documents that I had in San Pedro. However, I was able to

surpass these difficulties primarily through my attempts to reciprocate the cooperative's help.

Before beginning my research, the president asked what the cooperative would gain from my research, and I proposed a report. He said that he would like to have a report prepared for the members, such that they would understand the difficulties of managing the cooperative. When I was in the middle of my fieldwork, however, I was told by a member of an NGO that had contacts with the cooperative that some members of the cooperative seemed unhappy with me. I assumed this opinion was influenced by them normally hosting foreign volunteers focused on financing small projects. I could see how the presence of a person who spent her time only asking questions could clash with their expectations. I decided, therefore, to start writing the report immediately and to work on it in the cooperative's office (also because that made it easier to ask for confirmation on the data I had or ask for the information I lacked). At the same time, I performed small tasks for the president of the cooperative. I took photos on public occasions and gave them to the cooperative. I also procured some information and pamphlets on how cooperatives could register in the water authority. In this way, I was tested for reliability and found an informal role in the cooperative (Bryman, 2008, p. 439). This seemed to help establish a better working relationship, and at the end of my research, the president of the cooperative and other members had become quite friendly and open.

My difficulties in the cooperative were also the result of a general atmosphere of tension, clashes and accusations that characterized elections in the cooperative, as well as the frequent accusations of corruption that had marred the cooperative's history. During my research, the current president was preparing a case against the previous president for mismanagement of funding and an audit was underway to evaluate the formal management of the cooperative. Probably due to this atmosphere, document consultation was, in general, less open than San Pedro. I was told that members that wanted to consult documents had to submit a written request to the cooperative and were not allowed to make copies. At the end of my research, however, I managed to obtain sufficient documentation to support and complete data collected through observations and interviews.

Understanding the relationship between the cooperative and its territory also presented challenges. The cooperative did not have a strong relationship with a specific territorial community and its relationship with the waterscape was often mediated through other territorial organizations, such as OTBs and gated communities. Such relationships are important to shape the cooperative's control over the waterscape. While the connection in San Pedro to one territorial community was clear, this connection was lost in Quintanilla. The cooperative control of its area of service was likewise weaker and most of its energy was focused on the control of its water sources.

To understand the connection between the cooperative, its waterscape and its users, I decided to investigate the relationship between cooperatives and OTBs. To explore this relationship, I interviewed representatives of six of the nine OTBs that form the area of service of the cooperative, as well as representatives of some of the gated neighbourhoods that received water and/or sewage from the cooperative.

Another issue I explored was related to the difficulties of the cooperative in expanding their area of service to new users and the consequences of such difficulties. Due to the size of the cooperative (and the fact that the maps were not as precise as the one in San Pedro), I could not systematically research those households that had been excluded from receiving water. Therefore, I researched the way in which the cooperatives decided to give the service to new users and asked users about the difficulties they encountered in receiving the service. Additionally, I interviewed a member of an OTB board of directors and a member of a gated community, who had asked to be connected to the water service from the cooperative but ultimately could not receive it.

3.7. Ethics and my position as a researcher

This section reflects on ethical issues I encountered in the field, and how my positionality influenced the data to which I had access. I decided at the beginning of my research (and

with the support of my first supervisor) that trying to make people sign consent forms in a Bolivian context might have been difficult and raise suspicion and mistrust. In such context, oral consent is generally considered appropriate (ASA; Association of Social Anthropologist, 2011, p. 2). I, therefore, prepared statements in Spanish which I distributed to my participants but that did not require a signature. In some cases, the document was extremely useful in putting people at ease, but in others, my participants just glanced at it. Therefore, I would sum up my research orally and ask if I could record and use their names and/or the name of their organization. Most of my respondents answered that there was no problem; only one respondent asked for his cooperative to not be named. This cooperative is present in the map of all cooperatives and on my list of interviewees, but all other information specific to it has been anonymized. Some of the people I interviewed, on the other hand, made a point to tell me that they wanted to be transparent as they had nothing to hide. Others told me that they would prefer to be identified only by their titles (e.g., the 'president of the cooperative X'). I decided to refer to all cooperative respondents by their titles and not by their names. Water issues in Cochabamba are highly politicized, and I prefer to err on the side of caution.

Some of the officials I interviewed in state agencies likewise preferred to be quoted only as officers of a determinate agency. The same was true of some experts I interviewed, especially those that held a critical stance toward the state. Therefore, I have not used people's actual names in this dissertation, but I use their role, and the level of detail I give depends on the consent I received from the specific person. The only exceptions are academics and some activists, in which case I believe revealing their names would lend more weight and context to their statements, but I have only included names if I was given explicit permission to use them.

With regards to water users, their interviews are anonymized, even if some told me there was no need and I could use their names if I wished to. However, I decided there were enough tensions in the neighbourhoods that I investigated to justify the anonymization of all interviews. This was particularly true in the case of small neighbourhoods, such as San Pedro, where most interviewees were well-known by the other inhabitants and members of the cooperative. In these cases, it is the researcher's duty to anticipate possible harms that might arise from their research (ASA, 2011, p. 4).

During my research, I was also aware of the necessity to give back to my participants. Foreign researchers are sometimes seen as ‘taking something’ from their participants and giving nothing in return. This was a concern for me also because I thought I could not fulfil the expectations of some of my participants. More than once interviewees asked if I knew some NGOs that would be interested in doing a project with them. This is a common experience for researchers in Bolivia (see: Walnycki, 2013), which does not have an easy solution. I did small favours when possible. However, I endeavoured to make it clear that I was not personally involved with any NGOs or other funding bodies.

As explained, I compiled reports for two cooperatives and built a database for FECOAPAC. However, I was aware of tensions between the cooperatives and FECOAPAC and between some users and the cooperatives. Therefore, I was mindful of the ethical implications when completing these projects. The compilation of a database on the cooperative for FECOAPAC required the collection of information from the cooperative respondents. As explored in Section 3.3, I endeavoured to clarify for my respondents what information would be made available to FECOAPAC and what would be used exclusively for my thesis. I explicitly asked for their permission to use that data to build a database for FECOAPAC. I finished the database months after my field work and sent it to the president of FECOAPAC, who subsequently commented that the information contained would be useful for them. The project I completed in Quintanilla was a report aimed to explain to their members the amount of work necessary to provide them with water and sanitation. Most of the information necessary for the report was obtained through employees and members of the board of the directors.

The project I undertook in San Pedro was more delicate, as it implied using the information given to me by the users to compile a report on how they viewed the cooperative. This report focused on practical issues, such as water quality, continuity, the sewage system and water prices, as well as the overall management of the cooperative. In the report, I did not include statements about specific members of the board of directors, political statements or discussions on the tensions in the OTBs or in the cooperative. I felt that this was outside the remit of such a report, which focused on issues concerning the service and how it could be improved. I informed interviewees that some of the information I was given would be used to write a report for the cooperative and asked if they consented. All informants in this report were anonymized.

During my research, I was also aware of my position as a white, young(ish) woman. This position influenced my research in different ways. Due to the frequent presence of (often female) foreign development workers, volunteers and researchers, NGOs and some state organizations were used to collaborating and being interviewed. Sometimes, especially at the beginning of my research, I would feel slightly patronized (one of my respondents asked if I had heard of the water war). This, however, changed in the re-interviews and in the last part of my research, both because some of my participants had seen me before and because my questions were more detailed and demonstrated more knowledge of what was occurring in the sector. The fact that I could demonstrate a degree of knowledge on the topics discussed also seemed to inspire more confidence. This effect has been particularly observed when experts are been interviewed (Mikecz, 2012, p. 483). However, I still had the impression that, as an outsider, I was considered harmless because I was not personally involved in some of the tensions in the sector. Researchers who are considered 'outsiders' can enjoy the tag of neutrality (Pack, 2006, p. 111). I believe that this positively affected the amount of data I obtained, as well as how open the interviewees were about their opinions.

My positionality also had an influence on my research with my two case studies. San Pedro was more welcoming than Quintanilla, as examined in Section 3.6. This could be due to many factors. Overall, the people sitting on the San Pedro boards of directors seemed more interested in my research, possibly because many of the board members were teachers and as it emerged from some interviews, they gave considerable importance to education. Another noticeable difference was the more predominantly 'feminine' environment of the cooperative. The influence that gender roles have during field work is well established (Bell et al., 1993) and often context-dependent (for an example from a classic ethnographic study in the Andean region, see Allen, 1988, pp. 81–89). The president and the plumber were not in the cooperative for most of the day. As a result, I would often be left chatting with the secretary, the person that guarded the cooperative water towers and the administrator (who were all women). Building personal relationships made my experience in the cooperatives easier as often people in the cooperative would actively try to help me and spontaneously tell me about issues I might find interesting. My experience was different in Quintanilla. As I already underlined, while the cooperative was used to having volunteers, the ones I was aware of were men. Also in Quintanilla, I was able to create a solid relationship with two female members of the board and with an older member of the board. Furthermore, as I underlined in Section 3.6.2, I was able to make myself useful to the cooperatives, even if I

was not asked to participate in the kind of manual work in which the male volunteer would participate. This allowed me to be accepted into the cooperative and to obtain the information necessary to my research.

The long time that I spent in the field and the personal relationships that I built with my informants helped me to obtain a clearer idea of the situation in Cochabamba, as well as giving me access to high-quality information. I was concerned, however, about the implications of my friendships with some of my participants. It became difficult to keep a distance from people that I saw every day and that I personally respected. Friendship with informants in the field has been examined in the literature, sometimes leading to the conclusion that the position of an informant and that of a friend should not overlap (Pack, 2006, p. 119). Like others (Geest, 2015; Walnycki, 2013, p. 62), however, I found it nearly inevitable and not an occurrence I actively tried to stop. When examining data, nevertheless, I endeavoured to be mindful of the effect of such personal relationships. For example, since some people who helped me since the beginning of my study saw the cooperatives as being undermined by the state, it was difficult for me to neutrally examine this view. I tried as much as possible to be unbiased in my analysis; however, this simply means I was mindful of my own biases, as much as such a feat is possible.

3.8. Data analysis

Data analysis does not necessarily start after leaving the field. During my long-term qualitative field work, in fact, new themes and hypotheses emerged, thus reshaping my analytical categories (Abel and Sankar, 1995, p. 4; Gilbert, 2008, p. 280). Furthermore, the reports I prepared allowed me to start ordering my empirical data. However, a more systematic data analysis started after I came back from Bolivia.

My research yielded a significant amount of data. I collected more than two hundred interviews, as well as multiple re-interviews (nearly 300 hundred interviews overall) and a

significant number of internal documents from the cooperatives and from state actors and field diaries. Interviews were transcribed verbatim and analysed in Spanish through the software Nvivo. Fieldwork diaries were also coded through Nvivo. I am aware that using qualitative analysis software might result in an excessive fragmentation of information (Bryman, 2008, p. 592). However, in my case, Nvivo was used simply because it was the best method to code a large mass of information. While I did code my interviews, I generally coded multiple sentences together to clarify the context in which statements were made. There was not, in my opinion, a qualitative difference from manual coding. The use of Nvivo simply made it easier for me to keep track of my themes and which groups of interviews had been coded and to retrieve them quickly when I needed them.

I first categorized interviews into five different groups and proceeded to separately analyse them. These groups were cooperative leaders, leaders of cooperative federations, state officials and respondents from each of the two case studies. The interviews were analysed thematically (Bryman, 2008, p. 554), allowing me to understand the respondents' different points of views concerning the conurbation. Themes and issues that assumed a particular importance for the research question were pinpointed (Buetow, 2010). In this period, I started to write descriptive pieces that synthesized my observation and gave brief descriptions of actors or issues. In this way, I was able to keep track of my reflections and to pinpoint further emerging themes.

When the coding was finished, I established the main themes on which I wanted to focus for each set of actors. I re-analysed the set of themes that emerged from the interviews, as well as my preliminary observations and analysis. In this way, I was able to establish common patterns in the way in which actors (i.e. the state and the cooperatives) talked about and conceived the waterscape, as well as the way in which they acted on it. A remarkable uniformity emerged around how sets of actors talked about certain themes, as well as differences amongst them (e.g. different levels of the state). Both were noted and transformed in descriptive pieces, and subsequently analysed. These descriptions constitute the bedrock of Chapters 3 and 4, as both report on how different levels of the state, the cooperatives in general and the two case studies act and see the waterscape. In both chapters, assertions over the way in which state or cooperatives actors act and conceive the waterscape emerged from this analysis. Once the chapters were drafted, I went back to the interviews to

re-check that, after the analysis process, my conclusions were consistent with the original interviews.

Later, I started to focus on some state projects or issues emerging in the conurbation (such as the construction of the Misicuni Dam and the issue of pollution in Rocha River). These projects and issues represented the lenses through which contrasts, collaboration and relationships between state and communitarian providers could be better observed. In this case, I compared the discourses of different state and non-state actors on the same subject to understand how these discourses differed. These discourses were useful to understand how different actors interpreted the same subjects, as well as their relationship with each other. These interpretations were supported through the analysis of state documents, when available. These discourses and contrasts were used mostly to draft Chapter 6, as they allowed me to examine the relationships between the state and the cooperatives. Some of the themes and issues that emerged were also used in other chapters. After drafting an initial version of Chapter 6, I again went back to the original interviews to check my conclusions.

I also prepared maps, which allowed me to make a disordered waterscape more legible. This allowed me to better understand the shape of the waterscape, as well as make it more accessible and understandable to the reader. These maps are presented in later chapters.

Conclusion

This chapter has provided an overview of the research process. Central to my capability to answer my research question was a mixed-methods, multi-scalar research design that aimed at understanding both how state and non-state actors placed on different scales influenced water governance and the deep relationships that communitarian organizations build on their territory. This research design allowed me to explore the different methods with which the cooperatives exercise power and influence water governance, as well as the roots of such power. As explored in Chapters 4 and 6, I argue that the cooperatives capability to control their territory through their members is the basis of such powers. The use of in-depth case studies allows me to understand how users and cooperatives create strong links with their waterscape and how these links are understood and represented not only at a material, but

also at a discursive level. Interviews with state officials at different scale also allow me to explore the differences and similarities between the views that different levels of the state hold over the waterscape of the conurbation (see Chapter 5).

Like all research processes, mine had some limitations. I had to make choices that allowed me to pursue certain lines of enquiry while limiting my capability to deepen my understanding of others. For example, my decision to conduct a case study of two cooperatives located in the same district had the positive sides that I underlined, but it stopped me from delving more deeply into the relationship that different cooperatives build with different municipalities. However, the research I conducted gave me enough material to allow me to adequately answer my research question.

4. The cooperatives' discursive and material control over the waterscape

Introduction

This chapter analyses the way in which the cooperatives exercise power over their waterscape. This power is the basis of their relationship with the state and, more generally, of the way in which they influence water governance in the conurbation.

The mechanisms through which the cooperatives exercise power are different facets of the way in which they materially and discursively build and control the waterscape. By material control, I mean their capability to shape the material waterscape. This involves a concrete control over their water sources, infrastructures and area of service. Their discursive control is created through the way in which they portray their waterscape, and it may include legal arguments, customary rules and the feeling of belonging and ownership over the waterscape. This discursive control, therefore, is often based on a shared vision of the waterscape, that

is: a shared hydro-social territory. The ways in which these two methods of control are exercised are the consequence of several factors. This chapter analyses what these factors are and how they developed.

The chapter draws on in-depth interviews with the leaders of 21 cooperatives and on the case studies of two cooperatives placed in District 2 of Sacaba. These different scales and spaces of analysis allow me to explore how the cooperatives use similar discourses and methods of control to assert and reinforce their power over the waterscape.

The first section explores why it was necessary for water cooperatives to establish their control over the waterscape and which characteristics influenced their capability to do so. To this end, I place the cooperatives in the context of the historical development of the conurbation. The second section examines how the cooperatives establish control over their waterscape. In that context, I explore their local history and the evolution of the local waterscape. The third section focuses on the challenges the cooperatives presently face to maintain control over their waterscape. I argue that the relationship between them and their members is fundamental for the capability of the cooperatives to confront these challenges.

4.1. The need for communitarian water organizations

This section analyses the way in which the evolution of the conurbation influenced the necessity of the cooperatives for acquiring control over their waterscape and the factors that influenced their capability to do so. To analyse such a process, it is necessary to place the cooperatives in the context of the evolution of the conurbation waterscape.

This section is divided into two subsections. In the first one, I analyse the overall process of urbanization of the conurbation, and its influence over the cooperatives as a whole. In the second, I focus in more detail on the case of the evolution of the waterscape of District 2 of Sacaba. An examination of the history of District 2 allows me to analyse more deeply how historical events, the evolution of different rural and urban organizations, and processes of urbanization influenced the cooperatives. As mentioned in Chapter 3, the District 2

waterscape is controlled by a mixture of rural and urban institutions whose interaction is an important issue for water provision in the conurbation.

4.1.1. The gradual co-production of the Cochabamba waterscape

This section describes the reasons for which communitarian water providers needed to take control over the waterscape. It also explores which effects that had in the distribution and quality of service of the cooperatives. The timescale in which that has happened is the same as that of the urbanization process of the Cochabamba conurbation. This is important for understanding the present characteristics of the cooperatives and how these characteristics influence the different challenges they now face to control their waterscape.

Accounts of the construction of the cooperatives by my interviewees emphasized the absence of the state from their neighbourhoods at the time in which they settled, at times underlining a sense of resentment that still influences their relationship with the state (see Chapter 5 and 6). Because of the disordered process of urbanization, large parts of the conurbation were excluded from access to state services and were built outside of state planning, in peri-urban areas[12]. These are where nearly all cooperatives are located today[13]. This void led to the foundation of communitarian organizations which proceeded to build their own water infrastructure, often together with other fundamental services, in a process that is the base for the control that they now exercise over the waterscape.

> And since the 1989, we dig the wells as much as we needed, and there were approximately 80 families at that time, and with the help of the international cooperation (...) and with our work, with our contributions, we built the well number one, that has one litre per second, that one has already finished its service, it is 20 years old this well. In this sector, in our neighbourhood, no government helped us, not the prefectures, not the municipality, all that we have it the fruit of the sacrifice

[12] In this thesis, I use the term *peri-urban* to indicate neighbourhoods that went through a process of self-construction outside the reach of state planning, therefore determining the construction of a multitude of waterscapes, through the construction of independent providers.
[13] An exception is the cooperative San Lorenzo, which serves the city centre of the municipality of Colcapiruha.

> of the inhabitant, the schools, the cooperative, all that we have *(President Cooperative Primero de Mayo, 21.11.2013)*

An examination of the history of the cooperatives is fundamental for understanding their current characteristics. The capability of communitarian providers to settle in areas with access to good water sources was influenced by the moment in time in which their neighbourhoods were established and the resources that were available to the first settlers. The process of urbanization pushed younger and poorer neighbourhoods towards areas with worse access to water sources (Walnycki, 2013). Furthermore, growing water scarcity made it difficult for newly established neighbourhoods to reach agreements with rural organizations for the control of water sources (Walnycki, 2013). Additionally, as established by Durán, while poorer and younger neighbourhoods are pushed to the outskirts of the city, older ones often assume 'urban' characteristics, obtaining legal status and access to services (Durán, 2007). In turn, these characteristics attract inhabitants with better access to economic and social resources.

The process of change, evolution and social differentiation of neighbourhoods was reflected in my interviews, and strongly influence the way in which the cooperatives are able to exercise discursive and material control over their waterscape (as examined in Sections 4.2 and 4.3). Some of them described their neighbourhood social composition as mixed, with middle-class, professional residents along with inhabitants with lower professional qualifications, or working in lower-income professional jobs, and at times precarious sources of income. A few interviewees attributed this mixture to internal migration. The expansion of the city, the transportation network and the rise of the cost of the land might have been the cause of these changes, as formerly undesirable neighbourhoods became more attractive.

> To give an idea we could classify the inhabitants in a variety of professions as you said, many dedicate themselves to agriculture, the fabrication of bricks, how can I say, the majority have their own land, they cultivate it, the majority do this … Now, those that came from other places, they are professionals in their work, they are lawyers, doctors, professors, a cultural variety, but the majority devote themselves to agriculture and brick making *(Manager, Cooperative Chacacollo Oeste, 25.11.2013)*

Such evolution of the waterscape led to today's distribution of cooperatives, the location of which is marked in the following map. As can be observed, most cooperatives are placed in the east-west direction of the conurbation and in the northern areas of Cochabamba. These are areas with relatively good water sources. Cooperatives tend to be well-established organizations, to be placed in likewise well-established neighbourhoods, and to have access to adequate water sources. In this sense, their service is on average better than that in other communitarian organizations (Lavrilleux and Compere, 2006, p. 52). This effect is not due to qualitative differences between cooperatives and other organizations. What emerged from my interviews is that mainly well-established water providers make the decision to officially register as cooperatives (for reasons that will be explored in Section 4.2). Only a few of these are placed in more marginal areas. These are the cooperatives that were more likely to be described as having low-income inhabitants and to have problems with water quality and availability. We can then see how wider process of urbanization influence the characteristics of the cooperatives, to say their physical location, access to water sources and economic and social resources. As such, the control that the cooperatives exercise over their waterscape is always directly or indirectly influenced by wider processes. A more in-depth example of such processes is given in Section 4.1.2.

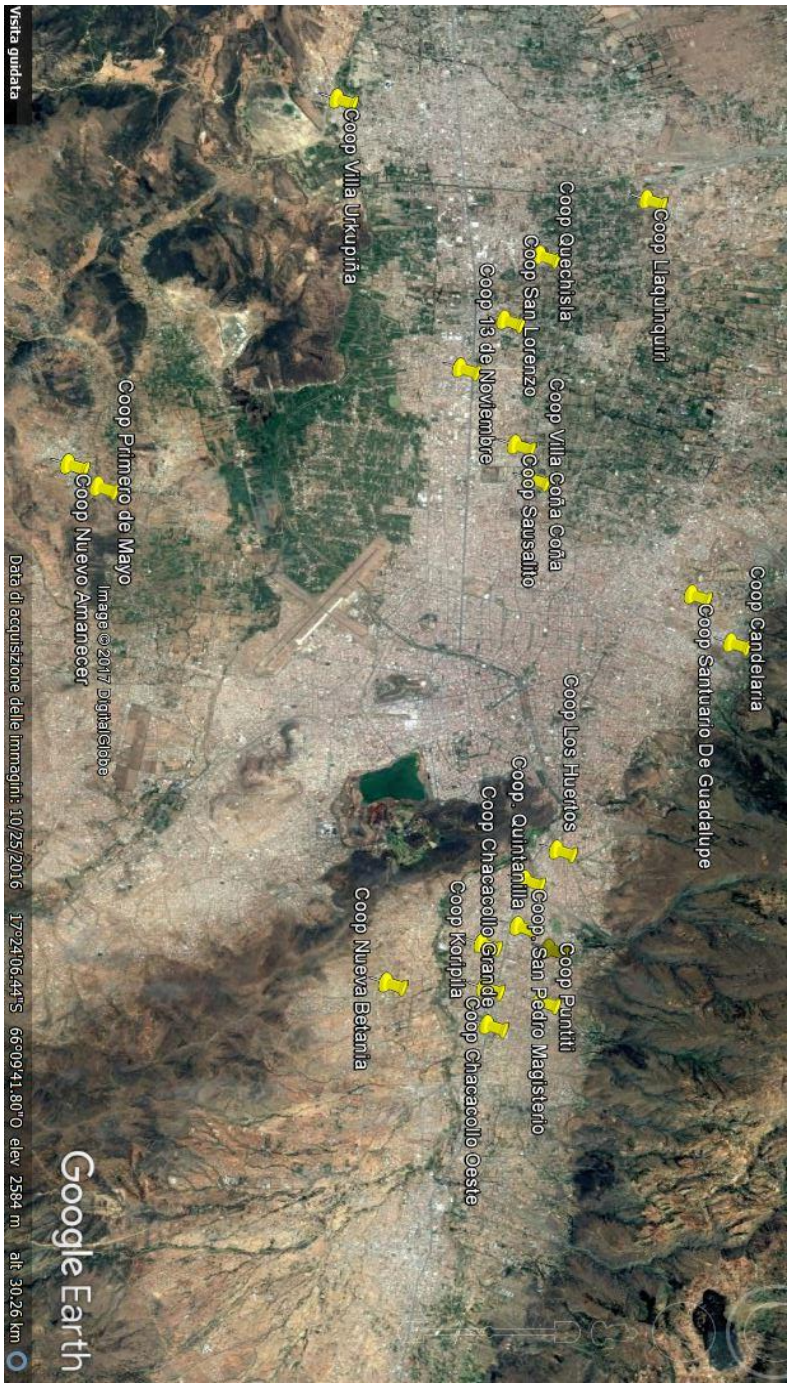

Figure 6: Map with the location of the cooperatives interviewed; base map: Google Earth. Author's elaboration, based on interviews and internal documents. The location of the Cooperatives Nueva Betania and Candelaria is approximative.

However, there are other causes for the variation in service amongst the cooperatives than their geographical location. Their capability to build better infrastructure also influences their ability to offer a good service. Better organized cooperatives or with inhabitants with higher access to resources could build, for example, water purifications systems. Only eight cooperatives had some system of purification in place, usually in better-established ones. This is natural, as purification systems are expensive. Only one cooperative's water (that of

Virgen de Urkupiña) was heavily contaminated (due to the sewage-polluted Rio Rocha's flooding their network). This cooperative is in a disadvantage neighbourhood, far from the city centre.

As it has been established, cooperatives were forced to take control of the waterscape due to the historical process of urbanization of the conurbation. Additionally, the waterscape evolved because of that process in a way that reflects the social inequalities of its inhabitants. This pattern was reflected in my interviews on the current situation. Respondents who described their neighbourhood as being composed of people with low incomes tended to belong to cooperatives that had problems providing adequate service due to characteristics of their waterscape. Age, resources and location in the conurbation influence the ability of the cooperatives to establish and control a functioning waterscape.

4.1.2. The evolution of the District 2 waterscape

In the previous subsection, I described why the cooperatives needed to establish control over their waterscape due to the absence of the state and the present effects of that process. However, it is not only the physical absence of the state that has an impact on the waterscape. Even if the state was not physically present in the waterscape where the cooperatives were established, certain state policies had a direct influence. In District 2, state policies influenced the shaping of the waterscape, even if state services only physically arrived recently.

Additionally, as the conurbation expands, it enters areas controlled by pre-existing rural organizations (Hines Thompson, 2015). Their influence is fundamental to understanding the shape of the waterscape today. These elements have a strong influence in the cooperatives, especially those that lack access to water sources in their own territory. In that case, the capability of a cooperative to control the waterscape is influenced by its capability to create and sustain relationships with pre-existing communitarian organizations. The cooperatives, therefore, are always influenced by external forces, and their waterscape should always be considered as part of larger waterscapes. Analysing the waterscape of District 2 allows me to exemplify the effect of such connections.

A former agricultural area, District 2 is placed between the river Rocha and the slopes of the mountain range Tunari, at the border with the Cochabamba municipality. The waterscape of the district is in large part controlled by communitarian organizations. The arrival of the municipal service provider (EMAPAS) in the waterscape is recent (approximately 10 years ago) and limited (the effects of its arrival in the district are analysed in Chapter 6). The location of the district can be seen in the map below.

Figure 7: District 2 of Sacaba. Base map: PMMC, 2013.

However, this situation does not mean that the waterscape has not been influenced by the state. State policies, as well as national processes, did so strongly and still do. Of central importance was the Agrarian Reform of 1953, which is still the basis of the distribution of part of water rights in the district. Mountain water has been channelled and collected in the district since the Colonial and Incas eras (Hines Thompson, 2015, p. 208). Before the 1953 agrarian reform, a few large landowners (*haciendados*) owned most of the districts, the most important of which were the Rivero-Torres. After the reform, part of the land and water rights passed to agricultural workers (Crespo Flores et al., 2004, p. 29), while some lands

were sold to urban settlers. The descendants of some of those rural workers still retain water rights and are organized in the Association of Irrigators of District 2.

> Some landowners had very large lands. Very large. But they started selling, selling. And there were some *haciendados*, or landowners, that had large extensions, like those of *El Castillo*. It was the family Rivero-Torres, from mountain to mountain, right? Then there was another, more in that direction, another Rivero-Torres, that was from this mountain, from there, to that other mountain (…) The government took the lands away from many of them, right? Because there was … with the agrarian reform, agrarian reform, because they were big landowners *(founding member Coop. Quintanilla n.16, 09/06/2014)*

Furthermore, state organizations control part of the water sources in the district, materially influencing the waterscape. The Cochabamba municipality has long used water sources located there to serve its municipal water service network (Hines Thompson, 2015). The mountain lake Wara Wara, traditionally used for water irrigation in the district, is now under the control of SEMAPA. Their right to do so is currently contested by the Association of Irrigators of District 2.

The current distribution of water rights in the district is thus still strongly influenced by both the consequences of the agrarian reform and by state intervention. The Association of Irrigators exercise considerable power over the water sources present in the district, and therefore on its waterscape. This is not an isolated case: the power of rural organizations to control water sources is widespread in the conurbation. This is also a consequence on the fact that the conurbation did not expand in a void, but in areas in which water rights were already established (Hines Thompson, 2015). Tensions between rural and urban uses are therefore frequent in the conurbation (see Chapter 2).

Additionally, the evolution of the district cannot be separated from the wider process of urbanization. District 2 underwent a disordered process of urbanizations, which led to a fragmented waterscape and strong socio-economic differentiation. Starting in the 1970s, the population spilled over the Cochabamba borders and began to build in areas surrounding the

highway that connects Cochabamba to Sacaba (Municipality of Sacaba, 2007). District 2 is no longer a rural district, even if some agricultural land is still present. It is now one of the most populous urban areas of Sacaba[14], and a fast-growing one. Interviewees reported that the price of land is increasing continuously, contributing to its socio-economic differentiation.

Due to the process of urbanization, some water rights passed from rural organizations to communitarian potable water providers, which currently largely guarantee water provision in the district. Most water organizations in it rely on well water. However, its three largest cooperatives (Quintanilla, Arocagua Puntiti, and Puntiti) and one water committee (Puntiti Chico) are currently able to access the water sources coming from or placed in the mountain range, most of which were previously controlled by rural organizations. These organizations are both irrigators and mountain communities in whose territories the water reservoirs are. The process through which cooperatives had obtained these sources was not smooth and took place through both formal and informal agreements, payments and communitarian decisions. These sources are governed through networks of overlapping rights and agreements, as well as constituting a physically complicated network that needs continuous attention to function. These agreements allowed these organizations to exercise control over the wider waterscape of District 2, however this control is negotiated and at times fragile.

Therefore, the waterscape of District 2 has been strongly influenced by state policies, direct state interventions, wider processes of urbanizations and relationships between different communitarian organizations. The consequences of such processes can be observed when looking at the control that different actors exercise over water sources. Such control is the result of the accumulation of historical events, which led to a very complicated set of power relations. For example, water from three mountain lakes, Wara Wara, Mercedes and Chungara, has traditionally been used for irrigation in the district[15]. Wara Wara is currently under the control of SEMAPA. A descendant of the Rivero-Torres family was still considered by district respondents as the legitimate owner of Lake Mercedes, but thanks to an agreement with her, the irrigators and the cooperative Quintanilla use its water. The irrigators have water rights over Lake Chungara. The cooperatives Arocagua-Puntiti, Puntiti

[14] Interview, Officer Planning Unit, Sacaba Municipality, 07/07/2014. The municipality estimated that the district hosted 50,785 inhabitants in 2005 (Sacaba; Municipality 2007: 54).
[15] Interview with the president of the Associacion of Irrigators of District 2 (19.07.2013).

and the water committees Puntiti Chico were able to obtain water rights to other mountain lakes, thanks to agreements with mountain communities[16]. The location of some of these sources is depicted in the map below.

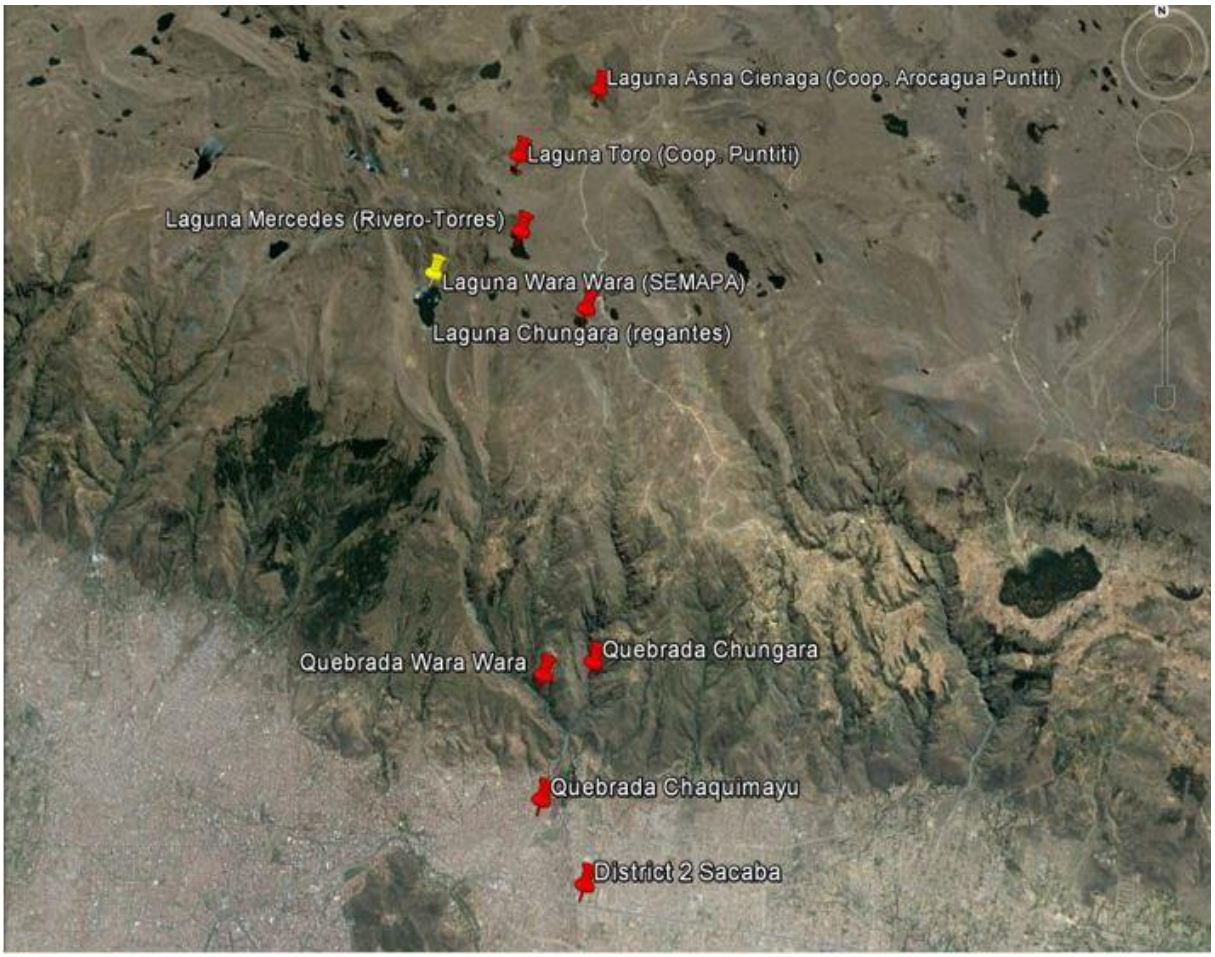

Figure 8:Mountain lakes and ravines of district 2. Base map: Google Earth.

To control and maintain such a complicated waterscape, cooperatives and other communitarian actors need to exercise both material and discursive power. The shape this control takes will be considered in the next section.

[16] Coop. Arocagua Puntiti: Laguna Asna-Ciénaga, Laguna de Sara Sara, Lagunas Piliwayt'ana (interview President Coop Arocagua Puntiti). Coop. Puntiti: Laguna Toro (interview President Coop, Puntiti). I was not able to pinpoint the exact location of the Lagunas Sara Sara and Piliwayt'ana. Furthermore, the Plan Maestro Metropolitano (PMMC, 2013, p. 3-4) contains some conflicting information. Therefore, only the lakes that were confirmed as water sources of the cooperatives through a process of triangulation are included in the map.

4.2. How the cooperatives established their material and discursive power

This section explores how cooperatives established their control over the waterscape, which is fundamental for understanding the basis of their power. To do so, the cooperatives needed to establish both material and discursive control. I frame material control as the capability of the cooperatives to create, maintain and modify the waterscape, while discursive control is the creation of an imagined hydro-social territory. This section shows that the two shape and co-create each other. To analyse how these forms of control were created and enacted, I focus on the micro-waterscapes of the cooperatives.

This section is divided into three subsections. The first one examines how power over the territory was established and looks at cooperatives operating in the whole conurbation. The second and the third sub-sections focus respectively on the cooperatives San Pedro Magisterio and Quintanilla. These two case studies allow me to gain a deeper understanding of how such forms of control were established. The case of San Pedro Magisterio allows me to examine how a strong link between a specific territory and a specific hydro-social territory made it difficult to expand the waterscape of the cooperative outside the limit of what was considered the residents' 'community'. The case study of Quintanilla allows me to examine the way in which control over water sources based outside their area of service resulted in a more intensive, but fragile, control over their material waterscape.

4.2.1. How material and discursive control empower cooperatives

This section analyses how the material and discursive control of the cooperatives over their waterscape was established, using interviews I carried out with the representatives of the conurbation cooperatives. In this subsection, I focus on the history of the cooperatives, on their control over water sources and on their process of formalization. These three elements allow me to understand how material and discursive control were established and how they co-created each other.

I start by analysing the retelling of the history of the cooperatives. In interpreting these histories, I argue that the construction of the cooperatives' physical waterscape and the creation of a hydro-social territory influenced each other, creating the two facets of the cooperatives' control of their waterscapes.

Historical analysis allows us to comprehend the material and discursive ways through which communities exercise control over their area of service and their water sources, which might overlap or not depending on whether the water sources are placed in the area of service. The construction of the waterscape of the cooperatives and the work, efforts and economic resources invested by their users are the reasons why the cooperative members conceive the territory of the cooperatives as 'belonging' to them. This feeling of belonging is often an important element of the members' willingness to protect their waterscape (in ways that will be examined in Section 4.3). This discourse of belonging through the sacrifices of their members is often supplemented with legal discourses. These are often secondary, as they are used to defend an ownership that is already deeply felt. Cielo (2010), in her study of the South Zone of Cochabamba, also explored how the efforts of the inhabitant to build their neighbourhood is used to justify their rights over their land, even if legal rights are absent. However, I argue that such method of control is widespread and it also used where the ownership over infrastructures and access to water sources is officialised.

When asking representatives of cooperatives to explain the latter's histories, I found significant similarities in the way in which they were told. Interviewees were keen to underline the contribution of neighbourhood inhabitants (*vecinos*) and members (shareholders/*socios*) of the cooperatives. This contribution was retold by relating that the cooperative was built through the efforts, sacrifice and work of all the inhabitants. Many emphasised how everything came from 'our pockets'. There was often a general respect for those who had contributed to the creation of the cooperatives.

The participation of the members of the cooperatives contributed to establishing and building the material waterscape, and therefore to establishing the material control of the cooperatives over the territory. However, the way in which this history is told often underlines the importance it now holds for the members of the cooperatives, beyond the simple physical construction of the waterscape. The importance of this history can be seen when looking at

retelling of communitarian works, that was used in most cooperatives to build at least part of the material waterscape. Again, the interviewees focused on the sacrifices that such communitarian works implied for the members of the cooperatives. Communitarian works were described as exhausting and often dangerous: in one cooperative two people died during the construction of the system.

> We went to the mountain to search for sources, and we got two to start with, and we went all to work in a group. We called the people, and we started with two sources, and, even during the first work, one person died because it is very steep, the mountain is very steep. And the next year, another person died because he fell, so that it costed us enough to do this work. First, we started with some pipes, and at the end there were some resources and we started to get members. To say, everything that we have done comes from our pockets. So, if we have to put a quota we put it ourselves for the pipes, for everything, because no one asked for payment for their work. Because we did it, everyone, in the weekends, every Sunday we worked, we succeeded and after we did all the documents. We did all of that, and now here it is, everything is legal already, right? *(Interview president of the Cooperative Candelaria ltda. 30.11.2013)*

The history of the cooperative is therefore necessary for understanding the way the waterscape was conceived, imagined and built, as well as the value granted to the cooperative due to the efforts invested in these processes[17]. These issues are explicitly stated in the following quote.

> Eh, I believe that our members … They care about the cooperative because they worked with shovel and spade … They did it personally. We have all done it, isn't it right? Men, women, children, we all worked. When we did not have resources, we went to the mountain with trucks and other things. And we dug the trenches, we buried the pipes. Others brought stones, others did other things … The ladies cooked … So, I believe that there was more will … Eh more will to want to have something.

[17] Most cooperatives received some external help to build their system from international cooperation agencies, international NGOs, church organizations and the state. In only one case however (coop. San Lorenzo), the initiative to build the system came from an external source.

> And it was for that, when during the water war they told us that we really would be affected, that the people started to get out. And we took part in it with Oscar, Omar[18], and other comrades, we took part in it. *(Presidente Cooperative Arocagua-Puntiti 11.08.2014)*

The president of the cooperative Arocagua Puntiti then underlined how the physical construction of the territory created a feeling of ownership and of 'care' in the members. This was the reason why they were ready to physically defend their waterscape against external menaces.

This physical control over the territory is not limited to the cooperatives, and it can have exclusionary effects, that is, other communitarian organizations' control over the territory may lead to clashes. The fact that communitarian organizations materially defend their territory against perceived external menaces (e.g. through blocking works and streets and participating in protests; see Chapter 2) can be analysed by looking at how cooperatives access water sources outside their area of the service. All cooperatives that do so need to put in place agreements with those communities that control the water sources. Agreements with external actors are one of the means through which the cooperatives exercise material and discursive control in areas outside their areas of services. This control is material, as infrastructures are built and often defended physically. Legal discourses are often used to justify their access. However, this control is often fragile.

An example is the attempt of the cooperatives Primero de Mayo and Nuevo Amanecer to dig wells outside their service areas. Both operate on the same difficult-to-drill rocky hill, and they attempted to build a well on a lower terrain controlled by an agrarian union. Primero de Mayo did not succeed. The president of the cooperative framed the activities of the agrarian union as illegal, as underground water is owned by the state, but did not manage to get support from the regional authorities, and without that support could not dig in an area that was outside its jurisdiction. He underlined the lack of help from the state and commented that when it was a state organization that needed to be defended, to say SEMAPA during the water war, they had come to its help. The cooperative Nuevo Amanecer, instead, managed

[18] Oscar Olivera and Omar Fernandez, two of the figureheads of the *Coordinadora*.

to reach an agreement with the owners of the land that allowed the cooperative to dig a well in exchange for free water.

This example illuminates how the cooperatives, and other communities, use a mixture of state rules (e.g. framing the behaviour of the agrarian union as illegal; calling on the departmental authority), informal agreements, and physical control to protect their waterscape. It also underlines how the state itself does not have complete control over these spaces and may avoid putting itself in the middle of territorial disputes.

Discursive control of the cooperatives over their waterscape includes both legal discourse and communitarian organizations' discourse of 'ownership' over it. This issue also emerged more widely when cooperative leaders were asked about the ownership of water sources. The cooperatives acknowledge that the state is the owner of underground water and often consult territorial authorities when a well needs to be built. However, there is a sense that when water is available in their community, it is the community that has the right to access and regulate it. In fact, cooperatives often consulted with the OTB when carrying out works. It should be noticed, however, that the OTB is still an organization that is controlled by the neighbourhood, even if it is a territorial authority and part of the state apparatus. OTBs are considered at risk of co-option by the state, however a good relationship seemed to exist between them and the cooperatives in most of the cases I examined. Therefore, the control might not totally lie with the cooperatives but still partially resides with the neighbours.

Therefore, while cooperative leaders claim that the state owns the water, they reserve to themselves the right to access it. Even if originally not formalized, the right to access water in their own area of service is seen as a result of the sense of communitarian ownership over their own neighbourhood. The right of communitarian providers over their water sources is now undergoing a process of formalization (discussed in Chapter 5). This dynamic underlines how legal discourses are a secondary means of control over the waterscape, as they are often used to ensure what are already conceived as legitimate rights over it. Legal arguments are used when external support is needed, often to defend the cooperative against external menaces. This process can also be clearly seen when analysing the reasons why the cooperatives decided to officially register as such.

Reasons to register changed in time, to respond to the difficulties faced by the cooperatives[19]. The representatives of the oldest cooperatives mainly related that their decision was based on a wish to strengthen their organizations and make their leaders more accountable. However, respondents belonging to cooperatives that were registered officially in the late 1990s and early 2000s told me they were afraid that infrastructures and water sources could be expropriated and put under the control of a private company. This fear is clearly related to the events that led to the water war. More recently-established cooperatives mentioned that they are afraid that the state would 'take over.' In this case, official registration as a cooperative is seen as a way to protect their physical waterscape from external appropriation.

4.2.2. Discursive and material control in San Pedro Magisterio

The San Pedro Magisterio cooperative has a small, well-established area of service where it exercises a strong discursive and material control. Such control was established through the foundation and building of the neighbourhood and the cooperative. This process contributed to the creation of a strong sense of community amongst the original inhabitants of the neighbourhood. Such strong, discursive control over a specific waterscape engendered conflicts when newcomers asked for the waterscape of the cooperatives to be expanded in the new areas of the neighbourhood. Some of such areas now receive water through small networks built and administered by the municipal water provider. Difficulties in expanding their territory is part of the municipal discourse over the weakness of the cooperatives and is therefore relevant to their relationship with the state.

The envisioning of a strong hydro-social territory connected with a clearly defined waterscape allowed the cooperatives to create a strong link with its members. This connection, however, also created exclusionary effects that damaged the legitimacy of the cooperatives in front of external actors. The example of the cooperatives San Pedro Magisterio, therefore, allows me to explore how the discursive control of the cooperatives is connected to its history, and how such control is related to the capability of the cooperative

[19] Of the 20 cooperatives interviewed, the two oldest ones were officially founded in 1987 and 1989, respectively; 12 more between 1990 and 1999, and 5 between 2000 and 2005. One is waiting for official recognition.

to control its waterscape. This example also underlines, however, that changes in the neighbourhood composition might weaken the shared hydro-social territory.

Discursive control in San Pedro is based on a sense of community created through its history, and a strong attachment to a single neighbourhood. San Pedro Magisterio was formed by a cohesive group of people with a similar background over a well-defined territory. Histories about the foundation of the cooperative often underlined a strong sense of community. The neighbourhood of San Pedro Magisterio was established in 1972 when the Federation of Urban Teachers of Cochabamba bought a stretch of land in the District 2 of Sacaba from the Rivero-Torres family and sold parcels to its members. When the first 20–30 families arrived, the only urbanized area nearby was the gated community El Castillo. Water could be obtained easily through shallow wells. In a few years, the inhabitants brought electricity and telephone lines to the neighbourhood, dug shallow personal wells and built septic tanks. The first water and sewage systems were built in the 1980s and were fed by a deep well. The San Pedro Magisterio cooperative was registered officially in 1996, and it evolved from an informal community organization to a professionally managed institution.

The imagined hydro-social territory of the cooperative is strongly linked and interwoven with that of the neighbourhood community. When asked about the history of the cooperative, interviewees often talked in general about the history of the neighbourhood, underlining the efforts of the inhabitants to make it a liveable area. Interviewees recounted that the first water and sewage systems were built through communitarian works and monetary contributions. The community also collected money through *kermesses* (a festival organised for fundraising through the selling of food and other activities). These efforts included not only the construction of basic structures and services necessary for individual families but also of those necessary for the construction of a real community: the elementary school, the Catholic church, as well as cobbled roads, sidewalks and the football field.

> And even before we arrived, we had already decided that we wanted a school for the children since public transportation was rare, it was difficult to bring the children to the city. At least we wanted a kindergarten, and it was established in the house of Moya, the first kindergarten. It was half built and so we made the chairs and some little tables out of bricks. And there was a teacher, which was also improvised, but

> she taught them well, and so we did everything as a community (*Water user n. 36 15.07.2014 San Pedro Magisterio)*

The neighbourhood is now a pleasant area, with good transportation links. Basic services are provided for the 1 454 people living in the neighbourhoods, including water, sewage, phone lines, electricity, domestic gas and rubbish collection (INE - 2012 census).

Figure 9: San Pedro Magisterio.

As the neighbourhood grew physically, tensions began to emerge between 'new' and 'old' inhabitants as to whether new areas belonged to the San Pedro Magisterio OTB. Their right to obtain water from the cooperative was also contested. These tensions exemplify how the discursive control that the cooperative exercises over the waterscape through a shared, imagined hydro-social territory influenced the evolution of the physical waterscape of the cooperative.

People living in new areas of the neighbourhood accused older inhabitants of behaving as if they owned both it and the cooperative. Longtime inhabitants responded that new neighbours

arrived when every service was provided, so they did not have to make any sacrifice. The newcomers claimed they had to pay a large amount for the land, while the pioneers bought it 'for a dead chicken'[20]. These arguments, as well as the overall clash, seem to be based on different justification for the rights to access and control the territory. The inhabitants of the new part of the neighbourhood underlined their rights as connected to their purchase of the land and on legal rights to receive the service. Older inhabitants connected their rights to the sacrifices they made, while also using legal arguments. Discourses are therefore mixed, but their importance varies. This reinforces my argument that both legal rights and discourses connected to the sacrifice made to build and control the territory can be employed by the cooperatives to reinforce the discursive control that they exercise on the waterscape.

This conflict is deeply rooted in the neighbours' sense of ownership and control over their shared space. The conflict started when the 'new' neighbours tried to modify the neighbourhood physically. Although versions of this conflict vary, it seems apparent that as the neighbourhood expanded, the inhabitants living in the 'new side' were able to take control of the OTB. As affirmed in the next quote, this shift was not welcomed by the older inhabitants.

> They do not want it, they say that we are usurpers, that we came to rob them, to invade, but it is not like that; (…) There was no capacity of the people from here to construct a common front and to win, there were always people with more initiative that wanted to work for the neighbourhood, but of course these people are "special" and do not let us, they say "only us and only us", and that is what is going on in the OTB *(Interview member of the board of directors Cooperative San Pedro Magisterio, 14.06.2014)*

The real conflict started in 2008 when the OTB, controlled by the inhabitants of newer areas, attempted to modify the physical space of the neighbourhood. The president of the OTB decided to give one of the last green areas in the neighbourhood to an NGO that intended to build an educational centre for children with disabilities[21]. This move was contested by some

[20] Bolivian expression for a very small amount of money, field notes, San Pedro Magisterio 2014.

[21] http://www.lostiempos.com/diario/actualidad/local/20081130/telemarat%C3%B3n-2008-logra-bs-1122245-e-inicia-otro_26331_34857.html (accessed in November 2016).

of the old inhabitants, who interpreted it as an attempt to 'give away' to a private association a place that they had hoped to transform into a recreational park for senior citizens. In the end, the project was dropped, and the old inhabitants decided to challenge the legality of the OTB elections, since the original documents of the OTB only included the original group of houses, even if the expansion of the OTB borders had been acknowledged by the municipality. A new president from the 'old side' was elected, and the OTB was effectively split in two. These events were recalled by the current vice-president of the OTB as an act of retaking control of the territory for the people who participated in its construction, underlining again the importance of history for maintaining control over the territory.

> I think that when someone takes such a responsibility, he also must know the history of the place where he lives, and in this neighbourhood the first inhabitants … It was a neighbourhood that was disregarded because at that time it was far away. The neighbourhood must be 30 years old, even more. At that time no one wanted to live here, and the first neighbours that came, they brought all the basic services to the neighbourhood (…) These people in the majority are now old, and our aim has always been to give them a place to meet. Because they were the ones that worked, that organized, they built the cooperative, they constructed the sewage, they cobbled the streets and now they are old. So that we thought that this space that we have available should be transformed into a space for old people. A place where they could go and meet, to remember their times … Because they were really friends, and if it was not for that unity we would not have the neighbourhood that we have now (*vice-president OTB San Pedro Magisterio 11.06.2014)*

In the case of San Pedro, there is a strong link between a specific neighbourhood and the imagined hydro-social territory of the cooperative. The cooperative, the neighbourhood history and the waterscape strongly overlap. Disputes over the control of the neighbourhood, therefore, also influenced the cooperative. Most of 'San Pedrito', a new area, is now served by the cooperative. The expansion of the network, however, caused tensions. Two ex-OTB directors living on the 'new' side of the neighbourhood explained that they were able to

obtain a network expansion only after 'an enormous fight[22].' Various points of view of this fight were summarized by a long-time employee of the cooperative:

> They said that San Pedro Magisterio, was only until the Avenida Perú, and on the other side it was another neighbourhood, so that it was not their responsibility to give water there. But the others said that San Pedro included also those roads, that is, it was not only certain roads. And also that if we had water we had to give it, that it was an obligation to give water to those that came to live here. And that our area of service was up to there, so that we could not deny the water service *(Employee Cooperative San Pedro, 08.08.2014).*

Any significant expansion of the water mains, however, needs to be approved by the general assembly. During that first expansion, the vote was split in the middle and the cooperative president at the time solved the impasse by voting yes. The expansion, however, is still remembered with unhappiness by some of the older inhabitants. This feeling has to do with its material consequences (a lower water pressure) but also with the fact that this water is seen as being 'owned' by the neighbours. These two elements can be observed in the following quote from one of the users of the cooperative.

> And everyone wanted to take our water everywhere. Do me a favour. It is not correct. I am like a pillar, a ruler. If things are not correct, even it is my mother that ask me, I say no. And I do not think that it is correct. But yes, furtively they gave to one family, then another and another. And there were problems for this, and for this there was the division of the neighbourhood. Because they asked, those of the other side. Now, what is going on, it is not to be stingy with the water, what happened is that the water, following the rule of gravity, go down to the lowest level, right? So that all of us in the area, we are without water. Only when they let the water go, in the first moment the pipes are full and it goes into our house. There in San Pedrito, they have water day and night *(User n. 36 Cooperative San Pedro Magisterio)*

[22] Interview user n. 32.

After that first expansion, only small network expansions took place, excluding part of the neighbourhood from the service of the cooperative. As can be observed in the map below, the network of the cooperative does not cover the whole OTB.

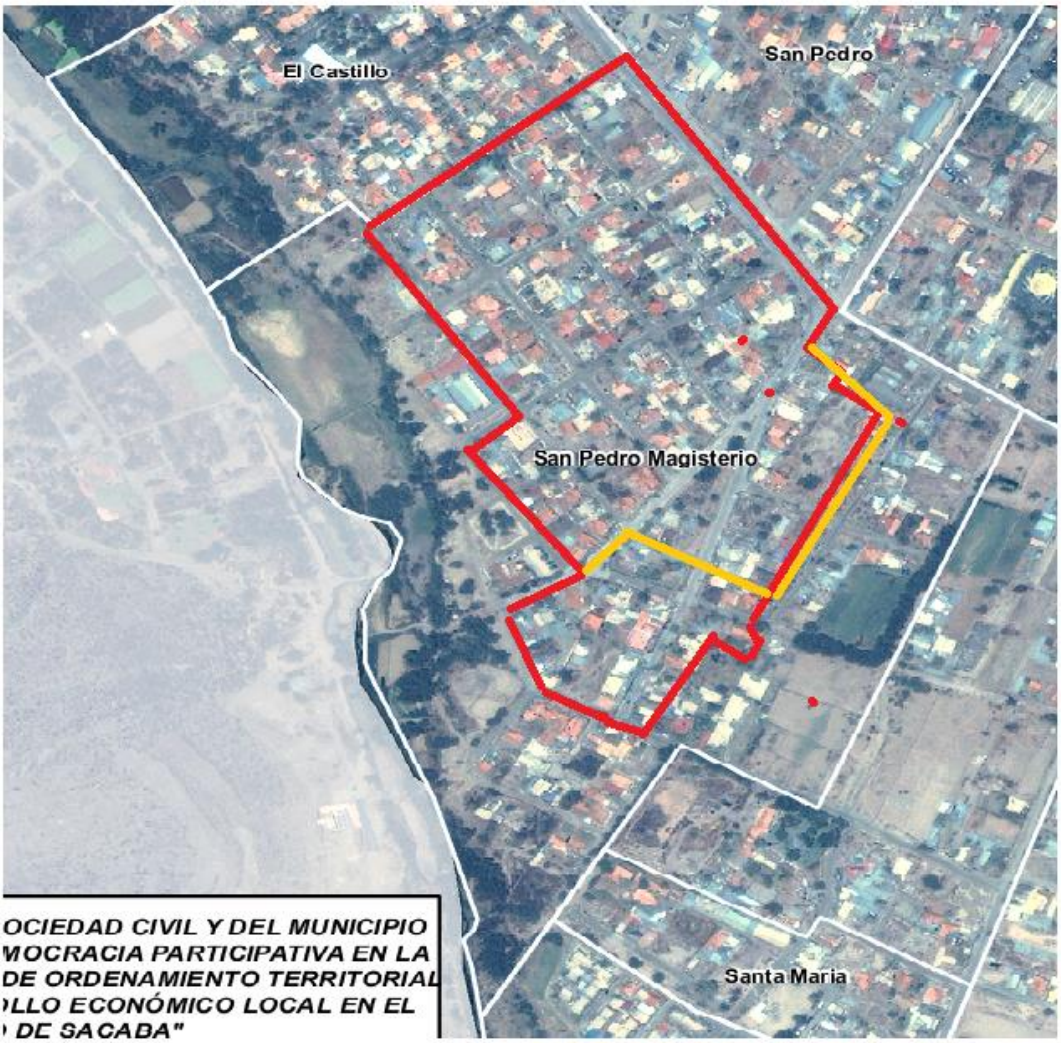

Figure 10: Map area of Service Cooperative San Pedro Magisterio. Base map: Municipality of Sacaba. Drawing mine. Red lines: limit of water service. Yellow lines: limit of sewage service.

This strong material control over the cooperative's waterscape, connected with a strong discursive control, creates exclusionary effects. These have repercussions for the cooperative itself. During the time in which the 'new' inhabitants controlled the OTB, they were able to obtain municipal funding to build a small water network that is now administered by EMAPAS. The conflict, therefore, led to a certain loss of control of the territory, as the

municipality started to take a more active role. The tensions that arose due to the physical presence of EMAPAS in areas bordering the cooperatives are examined in Chapter 6.

4.2.3. Discursive and material control in Quintanilla

The cooperative Quintanilla exercises control over its waterscape by mainly focusing on its need to access water sources placed outside its area of service. Access to most of these sources was obtained through other communitarian organizations. For this reason, the cooperative needs to exercise an intensive effort to maintain material control over the waterscape. Their material control is fragile, however, as it is mediated through other organizations.

Likewise, discursive control is focused mainly on affirming the right to access these sources, which is done in two ways. One is based on the rights of the 'inhabitants of District 2' to access certain water sources. These discourses are often based on a pre-existing system of rights and are used against actors external to the district, often during clashes in which cooperatives and irrigators defend their rights to access mountain water sources. The discursive control of the cooperative over the water sources is also carried out specifically through a retelling of their history, which is focused on how the infrastructure to bring water from the mountain sources to their system was built. This is part of the reason for the participation of the inhabitants and will be discussed on more details in Section 4.3.3. However, such a focus on the need to control water sources corresponds to a somehow weak discursive and material control over its large and fragmented area of service. Examining the case of the cooperative Quintanilla, I can see how discursive and material control influence and 'serve' each other, and often focus on point of tensions for the capability of the cooperative to maintain control.

An important element of discursive control comes from the history of how the infrastructure was built. The cooperative Quintanilla was funded officially in 1990, even if the works to build the infrastructure started at least a decade before. At the time, the area was sparsely populated, and the inhabitants received water from irrigation channels or shallow wells. A committee created by a few of the inhabitants organized to build the water infrastructure.

The first water source was a filtering gallery built in the ravine[23] Chaquimayo. The digging required in its rocky bed was physically demanding and at times dangerous work. The construction of the water system was partially financed by the Caritas Antoniana (an organization of the Catholic Church). In 1992, a sewage system and a Imhoff tank (a basic wastewater treatment procedure) were built.

Fast urbanization and therefore an increase in demand led to water scarcity. The cooperative accessed new water sources through a network of agreements with communitarian organizations, monetary payments, and communal works. Documents in the cooperative indicated that it acquired permanent rights to water turns for water sources from individual irrigators and that it occasionally receives water turns from single irrigators. Even though the board of directors in charge during my fieldwork managed to improve the situation, Quintanilla is still plagued by scarcity in the dry season. The need to acquire control over water sources, therefore, is a continuous struggle for the cooperative.

Material control over the water sources is obtained through agreements with other organizations. Such control, need to be continuously maintained. One of the ways in which access and control over water sources are maintained is through participation to work to repair and improve the infrastructures, often in collaboration with other organizations that share the same sources. This is not only physically needed but reinforce the right of the cooperative to access such sources as, traditionally, water rights are connected with the duty to help with maintenance (interview president of the association of irrigators, 19.07.2014). Mountain sources and infrastructures are often located in areas difficult to reach, so that sometimes work needs to be carried out without machines. Furthermore, extensive repairs are needed after the rainy season. Examples of such infrastructure and works required can be seen in the figures below.

[23] I here call ravines those structures that were referred as *quebradas* by my respondents. These are seasonal rivers that fill with water only during the rainy season.

Figure 11: Ravine Chaquimayo, District 2, Sacaba.

Figure 12: Work in progress to repair a broken pipe in the ravine.

Figure 13: Entrance of a filtering gallery.

Also, the maintenance of the networks of agreement through which the cooperative maintains control over water sources needs extensive efforts from the cooperative leaders. The cooperative was never able to obtain exclusive access to any mountain reservoirs, which weakens their capability to maintain material control. Control was then obtained through the negotiation of a shared access to mountain sources through the organisation of irrigators. The cooperative also participates in the Association of Cooperatives and Irrigators of District 2, composed of the three cooperatives of District 2 that receive water from mountain sources, the water committee Puntiti Chico, and the irrigators. This organization allowed the cooperative to strike agreements with other organizations for the shared usage of some water sources and to coordinate their management and maintenance. Adding to this, the cooperatives and the irrigators, separately and as a group, negotiated agreements with the mountain communities that control the areas in which mountain reservoirs are placed. The following figure represents the physical networks through which the cooperative receives water. Water arrives from different water sources and is distributed to different providers.

Figure 14: Water system of Cooperative Quintanilla. I developed this model using information I received during interviews with its members, and it was first used in the report I prepared for them.

The network of relationships that allows the cooperative to access water sources is fragile, however, and often based on personal connections. The relationship between the cooperative and the irrigators had in fact been shaky during the previous administration of the cooperative. The new board of directors instead worked to strengthen the Association of Cooperatives and Irrigators, and they obtained better access to shared sources. Most of the dealings with the irrigators in this period were carried out by one member of the board whose family had been part of the organization of irrigators.

The need to act with other organizations makes the material control of the cooperative over their water sources precarious. However, their ability to organize with other organizations to confront menaces to their water source coming from outside the district reinforces their collective material control. This was notably the case during the Water War, but also when problems emerged with mountain communities. The associations of cooperatives and

irrigators also organized a protest when a version of the yet-to-come Water Law seemed to menace their water access.

To control its waterscape, the cooperative sometimes needs to exercise a measure of material control on the entire district, often in alliance with other organizations. A problem that exemplifies this need is the issue of the Metropolitan Park, a protected area on the banks of the ravine Chakimayu. This is an area of recharge of the aquifers placed near the water deposit of the cooperative Quintanilla. Constructions in this area would damage the aquifer and therefore wells (which represent a secondary water source in the cooperative). Furthermore, it was feared that settlers could interfere with the water system of Quintanilla. The park was threatened when parcels were sold to expand urbanization. In 2009, members of the cooperatives Arocagua-Puntiti and Quintanilla carried out protests over the situation. In 2013, would-be settlers were evicted by inhabitants of the area. Both the president of the cooperative Arocagua-Puntiti and Quintanilla were active in initiatives to protect the park.

Such a strong focus on the control of the water sources does not correspond to a strong discursive control over the area of service of the cooperative. The cooperative is not based on a strong territorial community. The consequence of this on the cooperative relationship with their members is analysed in Section 4.3.3. The cooperative, furthermore, does not exercise a strong material control over their area of service. The waterscape of the cooperative is in fact physically fragmented. Its area of service overlaps in certain areas with other communitarian providers (see map below). EMAPAS has entered its area of service and taken over some areas of its sewage network. The consequences of this entrance will be analysed in Chapter 6.

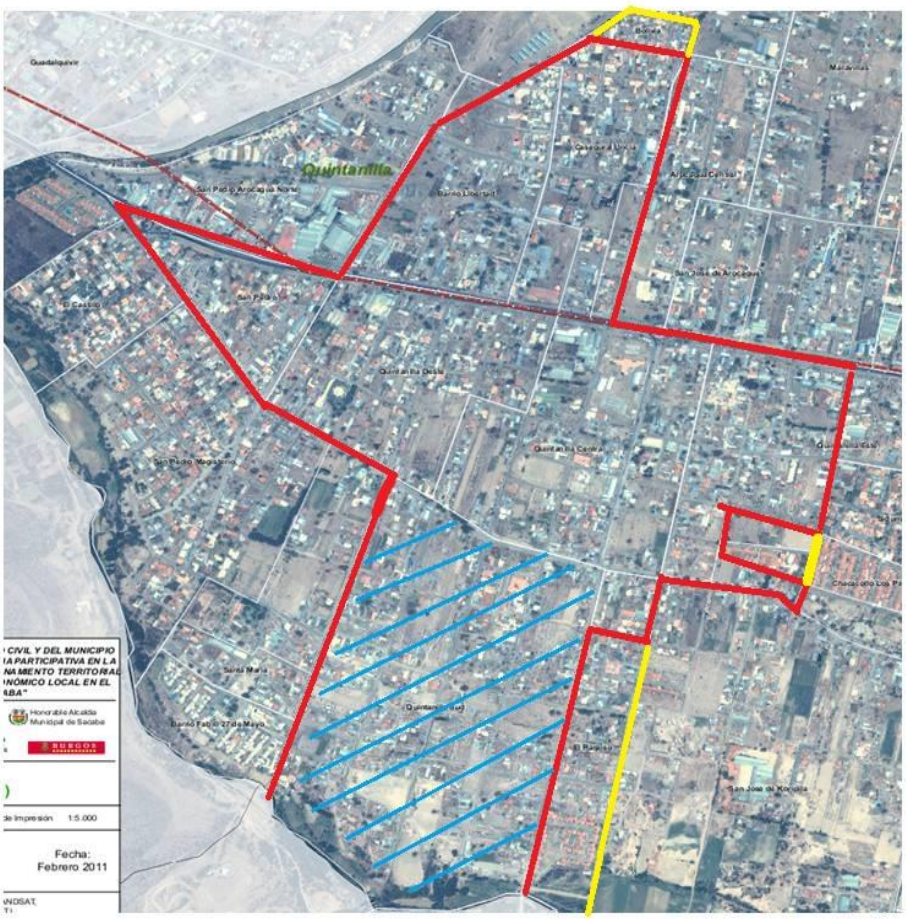

Figure 15: Service area of Cooperative Quintanilla. Base map: municipality of Sacaba. Elaboration mine. Red line: limits of water service, Yellow lines: Area where sewage service only is provided. Blue lines: service area of the Water Committee of Quintanilla Sud.

Looking at the three preceding sub-sections, we can then draw some conclusion on how the cooperatives established control over their waterscapes. Within the micro-waterscapes of the cooperatives, material control is established through the construction of infrastructures and the control over water sources, the mobilization of members of the cooperatives, and the creation of networks with other organizations — in brief, through the different forms through which the cooperatives create and maintain their material waterscape. Discursive control is established through the creation of imagined hydro-social territories. A central method is retelling the history of the cooperatives, which represents the central justification for ownership and control over their territory and water sources. A secondary way is through legal arguments. A minority of cooperatives, usually those in District 2, also establish discursive control on their water sources through customary rules.

This section also emphasizes how there are some differences in the shape these forms of control takes. These differences are influenced by the history of the cooperatives, and, more specifically, by their physical waterscape and the way in which it was created and evolved. In Quintanilla, the discursive and material control of the cooperatives over the waterscape is focused on guaranteeing its access to water sources. This is due both to the fact that these water sources are placed outside its area of service and on the fact that the cooperative area of service does not correspond to a coherent territorial community. As a result, the cooperative exerts a strong influence on the waterscape of the District, but its control over its area of service is not as strong. In San Pedro, instead, control of the cooperative focused on the control over its area of service. This is due to its history, and to the connection of to a well-defined territorial community. However, as the territorial community grew and changed this affected the control of the cooperatives and caused some exclusionary effects.

4.3. Control through membership

This section analyses how the cooperatives maintain control over their waterscape, focusing on the participation of their members. To this end, I explore the different forms of participation of the cooperative members and their effects on the ability of the cooperatives to control their waterscape. I argue that this participation is crucial for both the material and discursive control over the waterscape and that changes in the demographic composition and in the material waterscape of the cooperatives are modifying the forms of participation undertaken by their members.

The first subsection focuses on the entire group of cooperatives, to analyse overall trends. I analyse the ways in which the members contribute to the control that the cooperative exercises over the waterscape, and pinpoint emerging issues. To analyse the reasons for and effects of these issues in more depth, I then explore the two case studies. The cooperative San Pedro has a strong discursive control (analysed in Section 4.2.2), which can be seen in their relationship with their members. However, new members are reluctant to assume an active role in the cooperative, which could damage the material control of the cooperative over the waterscape in the long term. In the case of Quintanilla, I analyse how the cooperative's weak discursive control over their area of service (analysed in Section 4.2.3) is reflected in the weak participation of its members.

4.3.1. Maintaining control over the waterscape

To analyse how members participate in the cooperatives, this section focuses on both active forms of participation (such as in assemblies) and in passive ones (such as the payment of water bills). Both of these contribute to the discursive and material control of the cooperative over the waterscape. Different forms of participation are not used with the same intensity in all cooperatives. Changes in the relationship between cooperatives and members, in what I describe as a 'process of professionalization,' is transforming the way in which the cooperative exercises control over the waterscape. Such changes can have a weakening effect on the cooperatives.

As this section examines member participation in the cooperatives, I need to clarify what membership entails, as well as a member's official role in the cooperative. To establish a connection to a cooperative's network, it is generally necessary to buy a share and become an official member (*socio/*shareholder). The members' general assembly is the highest authority, and it makes the most important decisions (e.g. changes in water prices; construction of a new infrastructure). The assembly elects the board of directors, and only members can be elected to this cooperative governing body.

In contrast to the classic model of centralized service provision, the role of the members is not limited to paying the bills. They contribute with the payment of a share for the right to enter the cooperative, occasionally provide fixed monetary contributions for projects, participate in communitarian works and in the assembly, form the board of directors, and participate in protests and public events. Not all forms of participation are mandatory (see table below) but when they are, negligence is usually punished through fines. All these forms of participation ultimately contribute to the control of the cooperative over the waterscape.

PARTICIPATION OF THE MEMBERS		
Monetary contributions	**Active participation (mandatory)**	**Active participation (discretionary)**
• Payment of water and sewage bills • Payment of share • Payment of a 'quota': a share of the cost of projects • Payment of fines	• Participation in the assemblies • Participation in communitarian works • Participation in protests, streets blockades, civic events, various neighbourhoods events…	• Participation in the board of directors of the cooperatives • Asking for information on the functioning of the cooperatives • Offering professional help to the cooperative

Table 2: Duties and responsibilities of the cooperatives' members. I developed this table with data obtained from interviews with representatives of the conurbation cooperatives.

Members' participation is paramount in the cooperatives from a practical point of view, as it allows the maintenance, evolution and protection of the physical waterscapes, but it also has a symbolic meaning. Member participation reaffirms the sense of belonging of the cooperatives and the waterscape more in general to their members, and therefore strengthens the discursive control of the cooperative.

The payment of the share is one example. Shares have practical importance for the maintenance of the physical waterscape, as infrastructural works are often supported through new shares. The share's price is generally quite high: it can vary from around US$ 300 to

US$ 850 for a water connection, while the sewage connection is cheaper, around[24] US$ 200 to US$ 300. The share has more than a monetary significance. Through its payment, the members contribute to the construction of the waterscape, as well as acknowledging sacrifices from preceding members. In this way, the share payment legally and symbolically establishes that the cooperatives are also owned by new members and not only by those who participated in the first construction of the waterscape. The cooperative Arocagua-Puntiti makes this explicit: new members pay an amount considered the monetary equivalent to the labour of the first members.

Water price structure also contributes to the cooperative's discursive and material control over the waterscape. Cooperatives usually establish a 'basic monthly price' for a given amount of water. They then raise the bill as a function of the usage, with water becoming progressively more expensive. This structure allows for low prices for a basic amount of water, discourages waste and for-profit usage, and targets the wealthier members of the community. Special treatment is often reserved for services such as schools.

> This is why we have 10 categories for consumption, we do not want to make everyone pay a lot. There are poor people, old people, but there are people that are living in big houses. So, let them pay more, it depends on usage because we have meters. The basic consumption for a family is around 15 m^3. If you are using more, I think, what are you doing, you are either selling or you are profiting. This is to make sure that the water is used by those that need it (*President Cooperative San Lorenzo, 11/12/2013).*

This arrangement reaffirms the material control of the cooperative, as it confirms their right to control water consumption, either through prices or through forbidding certain usages, especially when water is scarce. It also underlines that water is not treated as a good to be sold, but as a service that must be managed to benefit the entire community. In this way, the

[24] For comparison, the minimum wage in 2014 was 1440 BOB (US$ 208) https://www.ine.gob.bo/subtemas_cuadros/salarioMinimo_html/SalarioMinimo_41201.htm consulted at 16/04/2018.

cooperatives reinforce the ownership of the community over the service and therefore their discursive control over the waterscape.

However, price structures in many cooperatives were revealed to be insufficient to guarantee their survival; that is, to ensure their capability to maintain their physical waterscape. Price structures determined at the time of foundation often did not consider the eventual need to renew the water and sewage systems. A consultant for water projects based in Cochabamba argued that water prices in communitarian organizations are usually too low and that communitarian providers rely too heavily on new shares for infrastructural works.

> They believe that they are all right, but in reality, they are a time bomb. And that time bomb is the infrastructure *(Cochabamba water projects consultant, 06.12.2013)*

In the long term, problems with water prices damage the cooperatives' control over their physical waterscape. Most of them stated that they had enough money to cover running costs, but most had problems with long-term maintenance and large projects (e.g. a new well). To finance emergencies and infrastructural works, some cooperatives revealed a reliance on 'quotas' from the members for infrastructural projects. This is a heavy burden, especially because this practice is more common (although not exclusive) to poor neighbourhoods, recently established cooperatives, or those with a poor infrastructure (features that are often correlated).

Awareness is rising of the necessity to cover long-term infrastructural needs: some interviewees commissioned professional analysis to establish new prices. However, increases must be approved by the members, and some cooperatives find this process difficult. A few that increased their prices stressed the importance of communication with the members. The Arocagua-Puntiti president stated that since the members participated in the construction of the water system and still do much communitarian work, they think that the water should be cheap. Communication and perception of the cost of running the water system, therefore, plays an important role in the failure to increase prices. This is a clear example of how the relationship between the cooperatives and their members influence their capacity to control and maintain their physical waterscape.

However monetary payments are not the only forms of participation. Active participation is also fundamental (e.g. in assemblies and communitarian works). In the cooperatives (as in most communitarian water providers), fines are established for failing to participate. Different forms of participation correspond to different requirements for controlling the waterscape. In some cases, however, a reduction in participation can weaken the cooperative control. How intensive the active participation of the members is, changes between cooperatives. Poorer and younger cooperatives often require more intensive participation in communitarian works, for practical reasons. Better established cooperatives often need less member participation in the material construction and protection of the waterscape. In some cooperatives, the role of the members now approximates the role of a customer, shifting most of the work to employees and elected officials. We can then speak of a growing 'professionalization' of cooperatives. However, member participation is also necessary in the assemblies and on the boards of the directors of these cooperatives. Scarce participation in both might lead to a scarce legitimacy to decision-making and/or a heavy burden placed in the few willing to participate.

Furthermore, active participation in communitarian works and the active defence of the waterscape remains fundamental in certain cooperatives. While some of the younger/placed in more disadvantaged neighbourhoods ones often maintain a high level of participation, this is a problem for older/better-established cooperatives, which nonetheless need the active participation of their members. This is particularly true for cooperatives with water sources placed outside their area of service, which need active maintenance and defence. A few interviewees complained that some members expected the cooperative to take care of all manual work or might prefer to pay a fine for non-participation. In some cases, this change in attitude was attributed to socio-economic transformations of their neighbourhoods.

One of such cases is the cooperative Arocagua-Puntiti, whose president described how they needed to actively rebuff attempts to avoid communitarian works. Their water sources are placed in the mountain range. As such, they need to be protected (e.g. from other communities and from legislative changes); they also require intensive work to carry out maintenance. Lack of involvement could seriously compromise the capability of the cooperative to control and maintain the waterscape.

> The people of the place, the people from before, they are very hard-working. They do not care about the rain, the water, they go, they work and everything else. And the people from the city, they went there and then said: “I did not pay to have to do this work.” So, they believe that if one pays that is enough (...). To say, they would like to behave like it was a private enterprise: “I pay and I demand that they do all this” *(President Cooperative Arocagua-Puntiti, 11.08.2014)*

I analysed how the participation of the members in the cooperative is fundamental to maintain the symbolical and discursive control over the waterscape. I underlined some emerging issues that could damage this control. Why these issues emerged in the context of the case studies, and how the cooperatives reacted to them will be analysed in the next two sub-sections.

4.3.2. San Pedro Magisterio and the maintenance of control

As underlined in Section 4.2.2, the cooperative San Pedro Magisterio developed in a way that ensured its strong discursive and material control over the waterscape. Over time, this control was maintained through strong continuity in the administration of the cooperative, which was carried out by employees and directors with a strong base of knowledge over the waterscape and with a personal relationship with many of their members. Such knowledge also works the other way, with water users having more knowledge and more faith in the working of the cooperative than the ones in Quintanilla. The cooperative presents some issues, however, such as a certain lack of initiative to solve old problems, and scarce participation of members outside a group of ‘old members’. This situation threatens the capability of the cooperative to create and recreate its waterscape.

The cooperative has good material control over its waterscape. Observing the day-to-day life of the cooperative, I could see that most issues were swiftly dealt with, and that the three employees and board of directors had things well in hand. A map hanging in its office underlines each pipe and connection (as names of users were on the map I do not show it here for privacy reasons). Employees seemed to know nearly all users. A strong material

control over the waterscape also meant that the cooperative was able to keep payment arrears to a low level through warnings (and even water cuts).

While the cooperative can function relatively efficiently, several long-term problems might affect their capability to control and maintain the waterscape. The cooperative could cover current costs, including sudden expenses (e.g. a broken computer); however, an internal report stated that its patrimony was diminishing, and that new members' shares were not enough to replenish it (in fact, it had only 3-4 new connections per year). Therefore, the cooperative encountered difficulty in financing the large projects necessary to renew an ageing infrastructure and solve problems in service quality. Water continuity is good, but water quality is not high, and members often complained about the presence of residues in the water, which caused it to run dark at times[25].

Due to the need for infrastructural works, a few directors stated that prices should be raised, but that members would disagree. As far as I know, however, there were no recent attempts to raise water prices. Water and sewage prices were already relatively high compared to other cooperatives, especially for high water usage (as the price grows exponentially with the usage). The average bill[26] is 50 bs. When I discussed the possibility with the members, most stated that they would be open to raising the prices if it was associated with an improvement of the service, or if it was needed to respond to economic difficulties. In a concrete indication that the members are open to paying more for improvements, the assembly agreed to raise sewage prices to take care of the new wastewater treatment plant. A good relationship between members and the cooperative, therefore, could mean that the cooperatives could be able to raise their prices if needed. This could ensure the capability of the cooperative to maintain and improve the waterscape. Underlining this, users interviewed often mentioned that it was the duty of the users to pay their bills so that the cooperative could work. They did not seem to resent its strict policies on arrears, and even some interviewees, who arrived hastily after their water was cut, told me that they felt the cuts were necessary. Such good relationship between members and the cooperative is therefore

[25] A 2012 analysis indicated that concentrations of iron, manganese, nitric nitrogen, and turbidity were beyond the acceptable limits. While not mentioning health effects, the analysis report noted that water might have a displeasing aspect, stain clothing, and deposit residue in pipes — all effects that took place.
[26] 2012/2013 internal document. 50 *Bolivianos* are 3.5% of the Bolivian minimum wage.

fundamental to maintain material control, ensuring that the members contribute enough to the cooperative.

However, a good relationship between members and the cooperatives did not necessarily result in active participation. As San Pedro does not need extensive communitarian works, due to the simplicity of the network, participation should mainly take the form of partaking in assemblies and in the board of directors. Yet involvement of most of the members was limited to participation in the assembly, which meets once or twice a year. While fines ensured that most members come to the meetings, very few people were willing to stand for elections, outside a circle of old-timers. Furthermore, the many renters in the neighbourhood are not allowed to participate in the cooperative, reducing the pool of people that would be able to contribute to it. This aspect also contributes to a certain detachment from the cooperatives of part of the population.

A limited pool of members ready to participate in the board of directors of the cooperatives could lead to damage in the long-term relationship between cooperatives and members. One of the members of the board of directors told me that some members complained that the same people are always in the board of directors. One of the interviewees alleged that a group of friends in the board of directors keep voting for each other, and a group of older ladies in the assembly always vote for the same candidates. This is not a general complaint but, in the long term, it could damage the legitimacy of the board.

However, there are some encouraging signs concerning member participation. As the cooperative has evolved and changed, different forms of participation are needed to control the waterscape. In this sense, the impact of a decrease in traditional forms of participation might be mitigated through alternative forms of participation. For example, one lawyer was invited to be part of the board of directors, and she contributed to the cooperative mainly through her expertise as a legal consultant. Several other interviewees told me that they would be ready to contribute with their expertise, in a less structured and time-consuming way than as a member of the board of directors.

4.3.3. Quintanilla and the maintenance of control

As analysed in Section 4.2.3, the focus of the Cooperative Quintanilla material and discursive control over the waterscape is linked with the struggle to obtain water sources. This situation led the cooperative to become an important district actor and to exercise both material and discursive forms of control over the entire waterscape of District 2. These forms of control, however, are both intensive and ultimately fragile, as they need to be negotiated with other communitarian organizations. This fragile control is also reflected in the incomplete control that the cooperative exercises over its area of service. They do not have a strong discursive control over it, as they are not connected with a specific territorial community.

These elements weaken their relationship with their members. Newer members, specifically, often do not participate beyond paying for their bills and fines. Furthermore, lack of knowledge about the needs of the cooperative led the members to stop a modest price rise that would be fundamental for the cooperative's capability to maintain control over its physical waterscape. However, willingness to protect water sources also emerged from interviews with members. Older members often underlined the difficulties of obtaining water sources, and even newer members were aware of problems menacing their water sources and declared they were ready to defend them.

I start by examining how the cooperative relates to the OTBs, and how this relationship influences their connection to their members. The weak control of the cooperatives over their areas of service led to the need to use OTBs as mediators with their members. This also means that OTBs can make decisions that might weaken the territorial control of the cooperative.

Quintanilla has a large area of service and provides water and/or sewage service to 9 OTBs. Interviews with presidents of these OTBs revealed that some of them mediate the relationship between their members and the cooperative, relating the requests of their inhabitants or discussing with them the needs of the cooperative. However, during my stay in the cooperative, I observed that members, in particular older ones, would often come to

speak about issues directly with the president of the cooperative. Therefore, members do interact directly with the cooperative, even if some of these interactions could be at times ascribed to personal relationships with the president of the cooperatives, or to his role as president of an OTB.

The relationship between members and the cooperative then varied based on different factors. It was particularly weak in OTBs with their own water service, which receive the sewage service only from the cooperative. The particularly weak material control that the cooperative has in those communities is exemplified by the fact that one neighbourhood decided to pass its sewage network from the cooperative to the municipal company. Quintanilla was not able to stop this change (the reasons for and consequences of this action are discussed in Chapter 5 and 6).

The at times wavering control that the cooperative exercises on its area of service can also be examined through looking at the role of knowledge from the following two points of view. First, holes exist in the knowledge of the cooperative's leaders about their waterscape. Second, a general lack of knowledge about the cooperative exists amongst the members. Both issues influence its capability to control its waterscape, both materially and discursively.

In past chapters, I underlined the problem of lack of knowledge over the waterscape of the conurbation, as caused by its disordered growth. This issue is exemplified by a lack of precise maps. The maps of the cooperative Quintanilla (see figure below) were not particularly detailed, and I was told that even employees of the cooperative ignored the location of a few sewage connections. This omission was also probably due to the disordered and fast-paced growth of the neighbourhood and of the cooperative's network. It influenced the capability of the cooperative to control their area of service materially.

Figure 16: Map of the water network of the Cooperative Quintanilla.

Furthermore, the complicated nature of the infrastructure that brings water to the cooperatives also made a detailed knowledge over it difficult. To run the cooperative, this 'local' kind of knowledge is necessary: on the one hand knowledge of its complicated infrastructures, and on the other awareness of the intricate webs of agreement that regulate water access. Not all members of the board of directors had a clear idea of how this network worked. Furthermore, the management of the cooperatives implies the knowledge of bureaucratic and accountancy rules. Many members of the board of directors admitted that before being elected, they had no idea of how difficult it was to manage the cooperative. The need to quickly acquire a large amount of information when new members of the board of

directors are appointed also affects the capability of the cooperative to control their waterscape efficiently.

Lack of knowledge also influenced the relationship between the members and the cooperative, both in terms of discursive control and, consequently, its material control. The lack of knowledge among the members of how difficult it is to bring water to the cooperative was considered a central problem by the members of the board of directors. Specifically, the general assembly's refusal to increase water prices was attributed to ignorance of the cooperative's situation. The refusal to increase prices then jeopardizes the capability of the cooperative to exercise a material control over its waterscape.

The cooperative needs to renew parts of its network and improve its wastewater treatment and water sources. Members of the board of directors stated that current prices were not enough to sustain the organization in the long term. Infrastructural works were made possible by new shares; however, further enlargement of the cooperative was becoming more and more difficult. Raising the water prices, one of the lowest in the conurbation, is then considered fundamental by the members of the board. The increase proposed in the assembly was nominally high (25%), but modest overall (5 *bolivianos* added to the basic price; as one director put it: 'the price of a sandwich'). However, the proposition caused protests and was partially rejected by the assembly (it approved an increase for commercial users only).

The board of directors tried to strengthen the material control of the cooperative over its area of service. One aspect of this was an intensive campaign to reduce arrears. It imposed fines for late payment, sent notifications to those at risk of water cuts, and even carried them out (after 6 months in arrears). The president met directly with debtors to convince them to pay. Payment plans were also allowed. These practices reduced arrears for the water service and put the cooperative in touch with users who were not even aware that they were supposed to pay for their sewage connection. However, there were long-term arrears for a few sewage users. Reducing arrears strengthens the control of the cooperative over its area of service, while it also improves their economic situation, and therefore their capability to carry out infrastructural works.

Another aspect that influences the cooperative's material and discursive control is the active participation of the members. This is particularly important in Quintanilla, as it is needed to reinforce control over water sources placed outside their area of service. While willingness to pay bills increased, it did not necessarily coincide with a willingness to participate actively in the cooperative. In sum, most respondents were good clients, but did not wish to take an active role in the cooperative. As an example, one interviewee told me that he would be happy to pay more for water, but also stated that the board of directors should make most decisions without asking the members.

Most of the members I interviewed participated in the assemblies, but their participation stops there. Communitarian work does not seem to be used often in the cooperative (I did not observe any instance). However, I was told that one project was carried out earlier the same year: cleaning out water channels. A few members were not even aware that communitarian works took place. There were, however, some positive signs concerning the capability of the cooperative to mobilize its members to protect its water sources. Those who participate at least modestly in the assemblies often mentioned the need to protect the cooperatives from external menaces, especially concerning their water sources. Most recalled the struggle to protect the cooperative's water sources from the harm that the urbanization of the metropolitan park would do (see Section 4.2.3) or spoke about organizations that wanted to 'take their water'. This way of thinking reinforces my argument that the discursive and material control of the cooperative is based on a sense of ownership and on a need to materially protect its water sources.

To resolve these tensions, the active participation of the members of the cooperative is needed. Such participation, as in other organizations, is ensured both through a form of discursive control and through fines for non-participation. In the Quintanilla cooperative, such discourses are also focused mainly on ensuring support when the defence of their water sources is needed. As explored in the preceding section, the sacrifices of the inhabitants to build the cooperatives are connected to a feeling of ownership. In the Quintanilla cooperative, however, the retelling of its history is focused mostly on the construction of the first water sources and on general changes in the district, and rarely on the development of the neighbourhoods that compose Quintanilla.

While the cooperative's officials have problems communicating with their members, and many of them are unaware of the difficulties of managing it, some of the members would be ready to contribute to the physical defence of the water sources. However, if participation in assemblies keeps decreasing, the capability of the cooperative to mobilize its members would diminish. Furthermore, if members keep repelling the proposal for a price increase, the long-term sustainability of the cooperative could also be damaged. A weak discursive control of the cooperative's area of service, therefore, led to a weak connection with the members that, in the long run, poses a risk of severely damaging the capability of the cooperative to materially control its waterscape.

Conclusion

This chapter explored the ways in which the cooperatives control their waterscape. I conclude that they do so by exercising both material and discursive control. This control assumes the form of building and maintaining the physical waterscape and of creating imagined hydro-social territories. These two forms of control influence and co-create each other. This chapter establishes the importance of the creation of a sense of ownership towards the waterscape, created through a communal history and a continued relationship between members and the cooperative. The weakening of these links reduces the discursive control, and consequently the material control of the cooperative over the waterscape.

This chapter establishes that the cooperatives strongly influence water distribution within their own waterscape, to say water governance. However, it also underlines that they are not the only actors influencing such governance. A series of other actors, such as other communitarian organizations and the state, also influence water governance in minor and major ways. Even within the micro-waterscape of the cooperative, therefore, water governance is a multi-actors affair.

5. State vision of the waterscape: knowledge, order and contradictions

Introduction

This chapter explores how the state affirms its role in the water sector. I argue that the state strengthens its role in the conurbation by modifying both the hydro-social territory and the physical waterscape.

State officials often view the waterscape as disordered. This perspective is due to the unplanned growth of the conurbation, which has led to the construction of autonomous providers over which the state has scarce precise information and even less control. These conceptions have prompted a desire to order the waterscape as well as strengthen the control of the state over it. The Bolivian state carries out three main policies which have the effect of modifying both the hydro-social territory – by making it more ordered and knowable – and the physical waterscape – through the construction of infrastructures controlled by the state. The first policy is the formalisation and registration of communitarian providers by the Bolivian Potable Water and Sanitation Authority (AAPS), the second is the consolidation of municipal providers, and the third is the construction of large-scale water and sanitation infrastructures.

These policies are carried out by different levels of the state, sometimes in cooperation with each other. The national state, specifically through the Ministry for Water and the Environment and its agencies, finances and carries out large infrastructural works in coordination with the municipalities. The AAPS regulates the sector. In Cochabamba, the departmental government is also involved in financing water projects, as well as in waste water supervision and mediation and coordination in the use of water sources. The municipality has a fundamental role in directly providing the service, and co-financing water

projects. While there are common perceptions over the need to strengthen the control of the state over the waterscape, the way in which such control is to be carried out and the way in which the communitarian providers are perceived varies with the level of the state. This has an effect on how different levels of the state interact with the cooperatives.

Section 1 of this chapter elaborates on the view of the hydro-social territories of the state which considers the waterscape to be disordered. I then focus on how the different levels of the state see communitarian providers. Section 2 looks at how the state is modifying the hydro-social territory of the conurbation and the consequences of such attempts. Section 3 examines the consequences of the state's direct modification of the waterscape.

5.1. State imagination of the hydro-social territory

This section analyses how the state sees and imagines the hydro-social territory. This analysis is necessary to understand how and why the state attempts to control and modify the waterscape (treated in the next two sections).

Examining interviews with state officials, I reach the conclusion that the state perceives the hydro-social territory of the conurbation as disordered, a situation often worsened by lack of accurate information. The state's perspective of communitarian providers and of its own role is influenced by this vision. State officials, especially at the municipal level, see the construction of a universal water provider, and therefore of a more ordered waterscape, as the ideal hydro-social territory. Some seem to look at it as the result of the 'natural' evolution of the waterscape. Such a vision of an ideal waterscape is accompanied, especially at the municipal level, by the depiction of the municipal providers as legitimate, and of the cooperative as 'private' organizations. While not all levels of the state look at the cooperatives in the same way, the municipality has stronger physical control over the territory, and therefore a more direct influence on the cooperatives.

The first sub-section considers the vision of state officials over the waterscape and communitarian organization. The second section looks at the ideal hydro-social territory of

state authorities, and at the effects this imagined territory has on how state officials see the cooperatives.

5.1.1. A disordered waterscape

As Chapter 2 underlines, in Cochabamba, the Bolivian state has never had complete control over peri-urban areas where a disordered process of urban development led to the auto-construction of communitarian providers outside of state planning producing multiple waterscapes. This sub-section argues that the existence of multiple, overlapping waterscapes has influenced the state's elaboration of hydro-social territories in the conurbation.

State officials view the waterscape of the conurbation as disordered, due to a lack of centralized control and planning. In interviews with state officials, the construction of a more ordered and fair waterscape was often associated with the growth of the control of the state. At the municipal level, this growth of control was often associated with a vision of an 'ideal' hydro-social waterscape in which a universal municipal provider would directly provide the service. This view of the ideal hydro-social waterscape varied slightly at other levels of the state. At the departmental and national state levels officials also often looked at the waterscape as in need of order, intended as a more centralized control and uniformity in the service. However, this control was less strictly connected with the direct provision of the service by the municipality.

In interviews with state officials, a lack of control over the waterscape was often associated with insufficient knowledge over water provision and infrastructures, specifically regarding peri-urban areas where communitarian providers operate. Interviewees in regional and municipal organisations often accumulated a good level of knowledge over communitarian providers, but accurate formal information was often incomplete or partially scattered among separate government agencies. For example, there is a lack of accurate maps depicting networks and sources of communitarian providers, and there are even doubts over the number of communitarian providers operating in the conurbation. An AAPS official related during an interview that they ignored how many providers in the conurbation are not registered.

Control and knowledge are then connected, so that state efforts to order and control the waterscape are often associated with attempts to make the waterscape 'knowable' (see Section 5.2.1). The necessity to collect accurate information before being able to carry out state infrastructural projects, and therefore strengthening the physical influence of the state over the waterscape, was often underlined by interviewees. The Metropolitan Masterplan, in particular, collected information from both state organizations and communitarian providers to create a depiction of the Cochabamba waterscape. The Metropolitan Masterplan, however, often underlines the lack of complete and accurate information, especially concerning communitarian providers, but at times even the infrastructures of municipal providers.

The association between control and knowledge influences how state officials look at independent providers. Analysing my interviews with state officials, I argue that they often considered the presence of communitarian providers in the territory to be an element of disorder and of 'illegibility'. This connection emerged particularly strongly in my interviews with municipal officials.

My interview with the vice-mayor of District 2, where I performed my case study, offers a clear example of this tendency. In fact, the vice-mayor, who was newly appointed by the mayor during my fieldwork period, had requested the compilation of maps that depict the characteristics of each water network in the district. Water cooperatives carried out most of the water provision in the district. Such maps are based on the information that cooperatives provide, so a municipal official characterised them as incomplete or imprecise. The inaccessibility of official information was a problem for the municipality from a practical point of view; for instance, they needed information on the condition of pipes before they could pave a road. However, it also implicated a symbolic problem, as cooperatives were not considered to be legitimate entities that should deliver such information to the municipality.

> What is happening is that, since we are a municipal and autonomous government, the entity that should regulate the functioning and the provision of these [water] services should be EMAPAS [the municipal water provider of Sacaba]. It is not possible that, as a municipal government, we have to ask for the certification to pave a road. If I need certification [on the state of the pipes], some cooperative needs to give me this

> service, when all the infrastructure should be centralised in EMAPAS, and EMAPAS should be able to give me that information. Even if this infrastructure is administered by a cooperative, it should be EMAPAS that give me a certificate. (*Vice Mayor, District 2, Sacaba, 30/07/2014)*

This quote illustrates how the municipal company is 'imagined' as a universal provider even if it is actually not. As emphasized in the next quote, furthermore, the vice-mayor framed the presence of the cooperative as a problem of 'duality' of authority despite EMAPAS not legally being the operator in the whole district. This perspective further underlines the belief of municipalities that the lack of direct control is problematic. He furthermore reasoned that the presence of cooperatives was a problem for municipal territorial planning. In other words, the cooperatives represented a source of disorder in the territory.

> So that, as I was telling you, with the presence of these cooperatives you understand that there is a duality of authorities or at least of organisations that provide the service. And the thing is that we have a problem in planning. On one side, the cooperatives do not have the technical capability to front the demands of the population. At this moment, for example, the population is growing. If before they had 1,000 members, now they have 2,000. This 1,000 more say, 'we want water,' but they say that they do not have the capability to support this demand. So, this, obviously, is a problem, because the population already does not ask the cooperative. In the Political Constitution of the state in Bolivia now, the service of potable water and basic sanitation is constitutionally protected. So that they obviously come to us with their demands, and we have to see what to do with them, and we are in a problem of overlapping competencies. *(Vice Mayor, District 2, Sacaba, 30/07/2014)*

The developments in District 2 of Sacaba exemplify the attempt of the state to 'order' and 'make known' the waterscape as well as its image of the presence of the cooperatives (and communitarian providers in general) as sources of disorder. Overall, municipal officials clearly viewed the municipality and its services as sources of order and fairness. For example, some remarked that there would be less variation in prices if they were the providers of the service. However, state officials at both the national state and at departmental levels occasionally criticised municipal providers themselves. Officials at the

national state levels criticised the inefficiency of SEMAPA. Departmental officials furthermore, suggested a need to order water governance at the conurbation level, and a contrast emerged between different levels of the state over who, how and which level should control the waterscape (see Chapter 6 for details). The consequences of these differences in visions on the relationships of different levels of the state with communitarian providers is considered in the next section.

This subsection has considered the view of the waterscape as disordered and of the presence of communitarian organizations as a source of disorder. The second sub-section illustrates the consequence of this conception on the ideal hydro-social territory of state authorities, and of the role that communitarian organization take in such imaginaries.

5.1.2. State's vision of the role of the cooperatives in the hydro-social territory

Interviews in the municipalities frequently depicted an ideal future hydro-social territory in which municipal providers – or a conurbation-wide one, if a municipal provider is not present – offer a universal service, and the municipality exerts stronger control over the territory. This vision is connected to how they conceive communitarian providers. In this sub-section, I analyse how the municipalities describe the cooperatives and underline how the discourse they employ tends to delegitimize the cooperatives and to reinforce the role of the state. I also underline, however, how not all levels of the state look at the cooperatives in the same way. While officials at most levels of the state looked at the cooperatives as fragile organizations that might disappear once state provision is strengthened, at the national state and at the departmental state levels officials did not often use delegitimizing discourses over the cooperatives.

State authorities – especially at the municipal level – often look at communitarian providers in the conurbation as a stop-gap measure. To say, they tend to believe that communitarian providers would eventually be substituted by a municipal or conurbation-wide provider. This was looked at as a somehow natural development due to the weakness of communitarian providers, the growth of the population and the strengthening of communitarian provision.

Interviewees in the municipalities emphasised that they would not take over the networks of communitarian providers against their will, but they looked at a universal municipal provider as the best and fairest form of provision, as it would homogenize access to water. The assertion of respect for communitarian providers could be a consequence of formal respect for the law, a political situation that precludes action against communitarian providers or a material situation that renders it impossible for municipal providers to provide a universal service.

Such depiction of the role of communitarian providers by municipal authorities, was often coupled with an attempt to delegitimize them by defining them as 'private' and, in certain cases, searching for 'profit[27].' I observed no evidence of a for-profit communitarian provider. These characterizations justify the lack of help from municipalities. In contrast, municipal providers are considered 'public' and, accordingly, more legitimate, although they often have little influence over a large area of the municipal territory.

Confusing legislation has furthermore intensified tensions between municipalities and cooperatives. The Constitution affirms the duty of the state to provide basic water and sanitation services (State Constitution art. 20.2). The responsibility to deliver the service is materially assigned to the municipalities, who can delegate this function to public, communitarian, cooperative and mixed water providers (Law of Autonomies and Decentralization, art. 83.3). However, the article does not specify the relationship between the municipality and cooperatives or other communitarian providers. This law has then been interpreted by both cooperatives and municipalities as the confirmation of their respective role in water provision. The legislation, therefore, does not clearly support the vision of the municipal providers.

It is important to note that not all levels of the state share the municipalities' depiction of the cooperatives. Other levels of the state have usually had a more favourable view of communitarian providers compared to municipal institutions. At the national level, interviewees from the ministry for water and from national agencies often emphasised that

[27] How the cooperative respond to this accusation is detailed in Chapter 6. As far as I was able to tell, cooperatives reinvest their profit (when such exists) to improve their infrastructures. Redistribution to share-holders is practically non-existent, apart for a few cooperatives where the share-holders that are on time with their payment and/or went to all meeting receive a food gift basket from the administration.

cooperatives and communitarian providers are not private organisations, and they were keen to underline their non-profit nature. When asked about the municipalities' opinion that cooperatives are private organisations, participants deemed it a 'misconception'.

> There should be no problem for any kind of provider, except for private ones, that are profiting … A cooperative is not considered as a private organisation, which is profiting from water. It is forbidden to profit from water. If there are profits in a cooperative, these are reinvested. Before, in Bolivia, we had transnational companies – private companies that came from all over the world. We had from France in El Alto 'Agua de Illimani,' and in this case, all the resources that entered were not reinvested in El Alto, but the money was sent abroad. This is forbidden. For example, water should not be sold. What are we seeing now is that the water service – water, as a human right, it is not-for-profit. The private companies make a profit, the cooperative … If it does have money in excess, it reinvests it in the improvement of the services of potable water, and a transnational company does not do that. *(Vice Minister for Potable Water and Sanitation, 19/08/2014)*

State authorities at the departmental level and state officials within the departmental offices of national state agencies, such as the Cochabamba branch of the AAPS, were also likely to have a positive vision of communitarian providers, despite frequently mentioning the need for communitarian providers to organise and improve their service to remain relevant.

Therefore, while different levels of the state might consider communitarian providers as legitimate, they still see them as at risk to be subsumed within larger organizations. Such evaluations of communitarian providers focus on economic sustainability and quality of service. As already underlined in Chapter 4, cooperatives encounter economic sustainability problems that are well known by agencies in the conurbation, especially when considering renovations and network extensions. Problems regarding water quality were also referenced alongside those concerning wastewater treatment. These problems were cited as examples of the long-term unsustainability of communitarian organisations. Although the general opinion is that communitarian organisations should improve their sustainability and level of service, state support for such objectives is limited.

A key insight from some state officials, however, was that municipal providers themselves – and SEMAPA in particular – are often not auto-sustainable. The major difference in the capability to expand their waterscape between cooperatives and the municipal providers derives from the ability of municipal providers to obtain state funding for expansions and major infrastructural projects.

In the conurbation, cooperatives are often excluded from state funding due to the delegitimizing discourses of the municipalities. This exclusion has an influence on the weakening of the cooperatives and the parallel strengthening of municipal providers. These delegitimizing discourses reflect the municipalities' perspective of the hydro-social territory of the conurbation, which in turn has a direct effect on funding choices. The hydro-social territory of the state, therefore, has a profound effect on communitarian providers. What these effects are, is analysed in more details the next section.

5.2. State's 'ordering' of the hydro-social territory and of the cooperatives

The preceding section has analysed the state's vision of the hydro-social territory as disordered and of an ideal hydro-social territory in which the service is brought by municipal or conurbation-wide providers. The state – and, more specifically, the municipalities – consider controlling the waterscape and providing the service to be its legitimate responsibility. Furthermore, municipalities often use delegitimising discourses towards communitarian providers, defining them as 'private' in contrast with the 'public', and therefore legitimate, municipal provider. Such vision of the waterscape has consequences. This section analyses how different levels of the state create and modify the hydro-social territory through discourses and legislation to push it toward their 'ideal' vision.

This section considers two policies specifically. The first is the registration of communitarian providers by the AAPS (the Bolivian water authority). The second is the way in which

municipal funding is used to reinforce the control of the municipality over the waterscape. These two policies are representative of the larger Bolivian water policy, which not only specifies the duty of the state to reinforce its service but also acknowledges communitarian providers. However, in the case of the Cochabamba conurbation, I argue that the currently dominant policy reinforces a governance model in which it is the role of the state to provide the water service. The hydro-social territory of the municipalities is, therefore, dominating state policy in the conurbation.

5.2.1. Attempts to make the waterscape knowable

The observation that the state views the waterscape as disordered, a conception often connected with lack of accurate information (see Section 5.1), is a suitable starting point to analyse the reorganisation of the sanitation sector under the Morales government. This reorganisation passed through a series of legislative and institutional changes.

The Bolivian legislation on water provision presents an apparent contradiction, as it both establishes the responsibility of the state to provide the service and officially acknowledges communitarian providers, customary rights and social participation in water management (Walnycki, 2013, p. 121). However, both processes can be interpreted as a way for the state to extend its control over the territory. Specifically, I argue that the drive to legally register and regulate communitarian providers is a way to make the waterscape more ‘knowable’ and controllable.

This sub-section then explores the impact of the registration of providers on the capability of the state to ‘see’ the waterscape and on the independence of the cooperatives. Looking at what are the effects of such registration in the conurbation we can observe that the registration is only minimally strengthening communitarian providers. Furthermore, it is dividing them in ‘legitimate’ and ‘illegitimate’ organizations and allowing the state to ‘map’ the waterscape. The official acknowledgement of communitarian providers, therefore, can be considered as a coherent part of a state policy aimed to reinforce its control over the waterscape.

The state is performing the formal registration of communitarian water providers through the concession of licences. Although social movements demanded the formalisation of communitarian water providers after the water war to allow for legal protection of the water providers' territories and water sources, activists and some communitarian leaders now regard it with a certain weariness. There is a fear that the state would damage the autonomy of communitarian providers. Such reaction reduces the capability of the state to register water providers, thus limiting its knowledge of the waterscape.

The formalisation efforts of the Bolivian state are currently within the domain of the AAPS, which was created in 2009. The AAPS regulates the sector and formally acknowledges and supervises communitarian, cooperative and municipal water providers. In addition, it acts as a user's protection agency. The AAPS registers water providers as official Companies for the Provision of Potable Water and Sanitation (EPSAs). This registration legally protects the provider's water rights and area of service. The AAPS is also theoretically charged with regulation of the water providers. However, the agency does not currently have the resources to monitor all providers.

The registration procedure does offer legal protection to the cooperatives, although it also indirectly delegitimizes those that did not undergo this process. Interviews with officials who work for municipal providers suggest that the licence gives protection to the area of services and water sources of communitarian providers. The need for registration with the AAPS is rising, as some municipal officials considered as legitimate only AAPS-licensed organisations. This is accompanied by the delegitimizing of non-registered organizations. Such delegitimization occurred implicitly, usually by defining those with a licence as 'real cooperatives' or underlining their respect for the territory of those with a licence. Nevertheless, two interviewees who work for a municipal provider explicitly referred to non-registered water organisations as 'illegitimate'. Therefore, licences are also becoming a method through which the state is distinguishing between 'legitimate' and 'illegitimate' organizations, and is, therefore, modifying its hydro-social territory.

Despite the legal protection from the regulatory agency, few concrete advantages of having an official licence have emerged. This might be one of the reason why several cooperatives have tended not to register with the AAPS. The AAPS managed to register around 200

communitarian providers in the Cochabamba department, but most providers remain unregistered, which is partly a consequence of funding limitations as well. At the time of my research, only five cooperatives in the Cochabamba conurbation had registered with the AAPS, which limits the state's opportunity to improve its knowledge of the waterscape.

The reasons for the failure of cooperatives to register are probably related to their mistrust in the state, and to their lack of knowledge of the process of registration itself. A general suspicion towards the state is apparent among certain leaders of water providers. One particular experience offered insight into why few cooperatives have registered: the president of one cooperative asked me to collect information about the registration process and specifically asked if there was a fee.

Resistance to provide information also appeared during the registration process, which asks providers for extensive information, including of a financial, economic and technical nature. An official whom I interviewed in the Cochabamba departmental office of the AAPS explained that directors of communitarian providers were sometimes reluctant to provide information. She said that such information might be difficult to collate but also that representatives of communitarian providers might be suspicious that such information might be used to impose taxes.

> This is the biggest difficulty to get all this information because they think that we, as a government, are going to impose some kind of taxes, and it is not like that. All that we want is to identify them so that we can protect their water sources, and also so that we can organise a little. (*AAPS Official, Cochabamba office, 28/10/2013)*

In principle, as mentioned, the AAPS not only registers water providers but also regulates them. However, at the time of my research, the AAPS did not have sufficient resources for systematic regulation. In Cochabamba, the AAPS was actively supervising only the three municipal water providers of the conurbation, which reflects another limitation of the state in controlling the waterscape.

Nevertheless, there is evidence that the state is trying to regulate cooperatives through the AAPS, albeit to a limited degree. For example, I observed that a few cooperatives had started to feel the effect of more intense control of the state over peri-urban areas and within the water sector. To my knowledge, the AAPS intervened directly in two cooperatives after users had presented a complaint after their water was cut. One of my respondents reported that they answered a letter from the AAPS by asserting that they never received support from the organisation or the state, so they did not have to obey. In the other cooperative, the AAPS contested the practice of cutting water not only for the non-payment of bills but also for the non-payment of fines for non-participation. In the cooperatives, the payment of the bills and fines were unified so that the payment of water was not possible without paying for the fines too. In this case, the cooperative acknowledged the authority of the AAPS and separated water payments from the payment of fines. They were still able, however, to obtain the payment of fines – essentially by presenting them at the same time as the water payment – but the president of the cooperative expressed concern that this practice might damage member participation in the cooperatives, as fines for non-participation might become difficult to enforce. Overall, however, the capability of the AAPS to actually engender a change within the cooperatives was challenged either directly or indirectly.

Therefore, the registration procedure hardly affects the cooperatives, though it does map the waterscape for the state. Considering the previous analysis, the process of registration has made the waterscape more knowable, but it has not effectively strengthened the cooperatives[28].

Scholars and activists have analysed the registration procedure as part of a wider attempt by the state to control communitarian organisations. From this point of view, there is no contradiction in the action by the state to register providers and strengthen its capability to directly deliver services. Crespo Flores (2017) has argued that this a contradiction in appearance only and that these state policies are a coherent way to incorporate autonomous organisations through a state-centric program.

[28] This might also be due to the fact that the cooperatives were already legally registered entities. To say, they were legally recognized as cooperatives, even if not as water providers.

The official acknowledgement of communitarian water rights is then a way to reassert the state's power over the water sector (Perreault, 2008, p. 849), while it had ambiguous results for communitarian organisations. Studies of the relationship between the state and communitarian or informal providers have often discussed the bid of the state to accumulate knowledge and render society knowable. For example, in their research on sanitation in Cape Town, McFarlane and Silver (2017) reference Scott's (1998) well known concept of 'seeing like a state' in order to argue that the state's power relates to its approach to 'mak[ing] life legible, standardized, measurable, and amenable to intervention.' The concept underlines the priority of the state to make the city understandable and countable. This process has been long running in Cochabamba (Hines Thompson, 2015, p. 186). It has recently intensified through these formalisation processes as well as projects such as the development of the Cochabamba Masterplan for water and sanitation, which included an evaluation of the conurbation waterscape.

Some activists and academics have characterised registration as damaging to the autonomy of communitarian organisations. One academic shared a concern that future governments could use the information that is acquired through the registration process to expropriate the systems. Oscar Olivera, a leader of the water war, argued that mandating registration is an attempt to control and co-opt parts of the water sector (interview, 11.08.2014).

Boelens et al. (2015) have proposed that attempts to register communitarian providers represent a form of governmentality, and it is certainly a way for the state to strengthen its control over an atomised waterscape. Communitarian organisations are encouraged to register in order to be considered 'legitimate' providers, which would signal the beginning of their self-regulation to adapt to an externally imposed paradigm. However, as underlined in Chapter 1, the concept of 'governmentality' as a totalising system should be only cautiously applied to the global south, as governmentality techniques are often 'contradictory and contested' (Kooy and Bakker, 2008). In Cochabamba, the capability of state organisations to control cooperatives and other providers has seemingly increased, but it has encountered limits, and the collaboration of communitarian organisations in the 'disciplining' process is far from ensured.

Finally, some activists and academics have identified the registering of water rights in AAPS as one cause of the heightened tension over water sources in the conurbation. For example, water sources which are shared between providers prompted conflicts once one provider acquired legal rights to it. Activists and academics viewed the bureaucratic nature of the AAPS as an obstacle to the communitarian providers' capability of solving conflicts through traditional rules.

> What the people wanted was a legal defence, but even if it was a proposal of the people, we saw that there were many gaps. Because all it did was to give people property rights over the water sources, and from there many conflicts started. Because there were collective properties over water sources, reservoirs, wells, dams. Issuing registers and licences … the only thing that they were doing was to create a conflict between two water systems that before shared a water source … Who owns the sources? Because to obtain the register or the licence you have to demonstrate that you have water sources so that there were problems over the service area between providers. Due to the complexity of communitarian systems, there are neighbourhoods that surround other neighbourhoods. It was a little complex, and it generated many discussions concerning water sources, areas of service, regarding who manages what. (*Cochabamba Water Activist, 26/03/2014)*

Therefore, the registration process provided little active benefit to cooperatives, although it did afford some legal protection. Furthermore, the registration and regulatory agency does not have sufficient resources to thoroughly monitor the cooperatives, and hardly any effects of its regulatory capabilities are apparent. These findings suggest that the most effective contribution of this procedure has been to map the waterscape from the perspective of the state, making it more 'knowable' and separating 'legitimate' from 'illegitimate' organizations.

5.2.2. Lack of funding for the cooperatives

This sub-section investigates the concrete consequences of the conception of municipal officials over the respective roles of communitarian organisations and municipal providers.

These discourses are accompanied by an active policy which excludes cooperatives, and other communitarian providers, from accessing state funding. However, not all the levels of the state share this vision. These differences emphasize the role of politics and power relations in the distribution of funding and in the relationship between cooperatives and the state more in general.

The municipality is effectively a gatekeeper of public funding. While the vision of the cooperatives varies by state level, the capability of cooperatives to acquire funding from higher state levels has been limited. Furthermore, in larger municipalities, the municipal government must finance a substantial share of national state projects. Therefore, I dedicate particular attention to municipal funding in this section.

The main source of funding for communitarian providers is a consequence of the Law of Popular Participation (LLP). The municipality yearly distributes funds for executing projects (e.g. paving a road or constructing a football field) to its OTBs (grassroots territorial organizations). The OTBs, which are officially recognised neighbourhood councils within the state apparatus, are in charge of requesting such projects for their neighbourhoods.

In this sub-section, I discuss how six municipalities in the conurbation have administered LLP funding for water and sewage projects. Furthermore, I consider how the delegitimization of the cooperatives presented in the precedent section is instrumental to exclude them from receiving such funding. I argue that the municipalities use LLP funding to strengthen their control over the waterscape, either directly or indirectly. There are differences in the form such strengthening takes in municipalities that do have a municipal provider – which aim mainly at enlarging their municipal network – and those that do not have one.

The latter, in fact, allows the usage of state funding to improve or build communitarian provider infrastructures through the OTBs. Interviewees in the municipalities without a municipal water provider noted that such infrastructures are owned by the OTB – not the communitarian provider – even when the OTB decides to allow an independent provider to manage them. The strengthening of the OTBs reinforces the control of the state in an indirect

way. Although OTBs are inhabitant-elected neighbourhood councils, they are reportedly at risk of co-option by the municipality and often involved of party politics (Driessen, 2008, p. 92) (Walnycki, 2013).

Of the three municipalities that have a municipal provider, only Cochabamba allows the usage of LLP funding to improve the infrastructure of independent providers. The other two smaller municipalities have recently approved municipal regulations that exclude independent providers from receiving such funding or to administer networks that were built or repaired using such funding. If an OTB wishes to allot LLP funding to improve an independent network, the network must pass under the administration of the municipal provider. As a result, smaller networks, which are sometimes physically detached from the main municipal network, would pass under the administration of the municipal provider. In this way, such municipalities can strengthen their direct control over the waterscape.

In all of these cases, LLP funding seems predominantly used to strengthen the control of the municipality over the waterscape. The remainder of this sub-section focuses on the justification for these decisions. I specifically address the influence of the municipality's perspective on the respective roles of the state and communitarian organisations in service provision on the distribution of funding.

First, I consider the case of the three municipalities that lack a municipal water provider – namely Colcapiruha, Tiquipaya and Vinto. In these municipalities, the Unit for Basic Sanitation only manages the sewage service. In the territory of these municipalities, LLP funding has been a primary means of state financial support for independent peri-urban providers. Respondents in the Tiquipaya municipal government relayed that OTBs receive the money for infrastructural projects, but they can decide to allow an independent provider to manage the finished infrastructure. Likewise, the municipality of Colcapiruha finances water-related projects that OTBs request, which they can then pass on to a communitarian provider. Both municipalities act as mediators for small-scale projects financed by national state programmes, such as MIAGUA I-II-III, which especially aim to build new infrastructures in areas that have no provider in place.

While these municipalities effectively facilitate the transfer of state financing to communitarian organisations, their mentality does not differ radically from those that forbid this practice. Respondents raised some doubts regarding the legality of this practice. A respondent in Tiquipaya underlined that the problem is present because communitarian providers think that they own the infrastructure when it is in fact owned by the OTBs. In addition, a respondent in the municipality in Colcapiruha affirmed that they 'must' provide the project to the OTBs, but communitarian providers should be economically independent. The necessity for funding to be passed through the OTB further marginalises communitarian providers and possibly damages their independence, as municipal policy can influence the OTBs.

Despite having SEMAPA as a municipal provider, Cochabamba exhibits some similarities with the cases that were described above. Single OTBs could decide to use their own funding to finance water and sanitation projects, that are then administered by a communitarian provider. Furthermore, the Cochabamba municipal provider aims to build a coherent network and has not expressed interest in including areas that are detached from their main network, unlike the case in Sacaba.

However, the overall aim of the municipality is to reinforce the position of the Cochabamba municipal water provider as a universal provider, even if a certain respect for independent providers is present. Past projects within the Cochabamba municipality exemplify the will of SEMAPA to aim for an eventual universal provision. A project that the municipality carried out in 2014 in alliance with the United Nations Development Programme aimed to build new distribution networks in peri-urban neighbourhoods. However, alliances were established only with the OTBs, and the pipes that were used had to meet SEMAPA'S requirements to allow for their connection to the SEMAPA network if it were to ever arrive in the area (Marston, 2015, p. 252). This development indicates another attempt to secure future control over the territory, which state institutions strive to implement, in order to integrate communitarian systems with those of SEMAPA. Furthermore, Walnycki noted that LLP funding in Cochabamba is generally given directly to OTBs (Walnycki, 2013, p. 200), therefore strengthening indirect control through the OTBs.

Thus, the role of OTBs in some municipalities in the conurbation has been strengthened by state projects for basic sanitation while potentially weakening communitarian providers. In this way, power has transferred from independent organisations to the OTBs. Academics and water movements proponents have expressed concern over this development, as OTBs have long been considered subject to co-option by the state as well as being less independent compared to water committees and cooperatives (Walnicky, 2013). For example, Driessen (2008, p. 92) has noted that the municipal government has used service provision in Cochabamba as a way to obtain votes from OTB presidents. Thereby, state authorities have used water, and water services in particular, to exercise control over the population.

Even in the absence of a municipal provider, state funding is only distributed within the state apparatus, which represents another way of indirectly reinforcing the power of the municipality over the territory. However, an attempt to control the waterscape more directly is apparent in the municipalities of Sacaba and Quillacollo.

An even stronger centralisation of funding (or, in the case Quillacollo, an attempt to do so) took place in these two municipalities, both of which have a municipal provider. In fact, they both recently installed a municipal policy that prevents independent systems from receiving funding for basic sanitation through the OTB. Those that request renovations or general infrastructural work to their system must allow the municipal provider to take control of the new/renewed system. This process reflects a broader effort by both municipalities, which have started to strengthen, expand and reinforce municipal water and sewage systems in recent years. This practice would allow the municipal government to assume direct control over the territory rather than needing to exercise power through an OTB.

The municipality of Quillacollo made the policy decision that infrastructure built with state funding should be administered by EMAPAQ. I was however told that this policy has not been consistently applied, as they did not wish to coerce the OTBs. In this case, the municipality did not have enough control to impose this policy. This could also be due to the fact that EMAPAQ was not, at the time, a sufficiently well-established provider, and was still in the process to receive the AAPS licence. The municipality of Sacaba has a larger and more firmly established provider and therefore has been successful in strictly enforcing this policy. Therefore, I further explore this case.

This policy was made enforceable by the municipality by assigning the Sacaba municipal provider (EMAPAS) the role of directly executing sanitation projects requested by the OTBs. For example, the vice mayor of District 2 relayed that funding for basic sanitation in the district should be directly given to EMAPAS. This policy allows EMAPAS to significantly extend its network.

> There are works ... any OTB that decides to use their allocated resources to build a basic sanitation system or a water system, very well, the condition is that they need to transfer it to EMAPAS; so that EMAPAS can administer it. In some cases, some committees passed to EMAPAS. Since they are state resources, we cannot do the work and then leave it to a private. We have to administer it. So, we are in this stage, and gradually they are being incorporated into the municipal administration by EMAPAS. *(Vice Mayor, District 2, Sacaba, 30/07/2014)*

The decision to limit the use of LLP funding for independent providers was supported by the image of communitarian providers as 'private' entities as well as through legal argumentation. Furthermore, it was often emphasised that it should be the role of the municipalities to provide the service. The respective conceptions of the role of the municipality and cooperatives, therefore, had a substantial effect on the distribution of funding as well as the strengthening of state control over the waterscape.

The decision to disallow the use of LLP funding for independent providers in the municipality of Sacaba was based on a municipal directive. However, interviewees frequently referenced a state law that forbids the use of state funding for 'private' organisations. A municipal official specified this law as the Ley SAFCO (Ley n.1178), which bans the donation of state resources to private entities. In the case of Sacaba and Quillacollo, the definition of a 'private' organisation was expanded to include providers administered directly by the OTBs, which are acknowledged as part of the state apparatus. Hence, 'private' encompasses all non-municipal providers.

However, the legal argumentation for these policies is based on uncertain legislation. State officials in departmental and national state agencies noted that the interpretation of the law

to exclude communitarian providers from receiving funding is far from univocal. This variation also reflects differences between state levels in conceptions of communitarian providers and cooperatives in particular. Moreover, it underlines the influence of political decisions on such policies. As the level of the state that more directly bases its power on material control of the waterscape through service provision, the municipality also conflicts more often with cooperatives.

Therefore, there are contradictions in the way that different state levels view communitarian providers. Such discrepancies emerge from differences in opinion regarding the right of communitarian providers to receive state funding. Contradictory beliefs are a consequence of a contradictory legislation as well as political choices. In fact, there is a regulatory problem concerning the capability of the cooperative to receive state-financed infrastructure. The vice minister for basic sanitation has reported ongoing efforts to clarify such legislation.

> Yes, the cooperatives send their projects so that we can finance the infrastructure. They send them, but when they start the management … But to start the work we must work with the municipal government (…), that is our weakness, the transference [of the completed infrastructure], but there is no problem if they give it to the cooperatives that use it. But, legally, it is not clear. There is a lack of regulation. We have a consultancy that is working. They just finished. They are going to tell us how we can transfer goods to private entities. *(Vice Minister of Potable Water and Sanitation, 19/08/2014)*

Based on my observations, in the presence of a political will, this problem was somehow bypassed, usually by stating that the municipality or OTB is the owner of the infrastructure but that the cooperative can use it. Thus, in such cases, the decision to permit the cooperative to receive infrastructural projects was essentially of a political nature and usually controlled by the municipalities, although the central state could theoretically decide to bypass the municipality if deemed necessary (interview, Vice Minister of Potable Water and Sanitation, 19/08/2014).

Moreover, some interviewees criticised the exclusion of communitarian providers from receiving state projects. Interviews with departmental and national state agencies officials revealed that OTBs and water committees were often considered legitimate recipients of projects.

> Of course, the OTB … what happens is that the municipality … first, the municipality has various resources. Some are direct resources that they manage. But others are resources that they must give to the base of the population – to the OTBs. And the OTBs are responsible to execute these projects and to generate, we can say, their basic needs. They can be water, sanitation, parks, a football field – I do not know, to cobble their streets or to remodel a square. Depending on their necessity, it can be put into the program. What I cannot understand is why they put conditions, I mean, 'if you want to invest in sanitation, you have to pass through EMAPAS,' right? *(Official Regional Government, Basic Sanitation Unit, 15/07/2014)*

The same official in the Unit for Basic Sanitation identified problems with financing the cooperatives specifically because they are theoretically for-profit organisations. However, he mentioned that this is a legal problem that should be solved by lawyers.

Other interviews also illustrated the influence of power on this decision. An interview with an official from the Departmental Directorate for Cooperatives revealed that miner cooperatives received help from the state through national campaigns (interview, 10/01/2014). The same interviewee noted the power of miners' cooperatives and that water cooperatives should organise more effectively by following their example[29].

Further examples of the influence of political decisions on qualification to receive funding also emerged from a more in-depth examination of the powerful cooperatives of Santa Cruz de la Sierra. Interviewees from the Vice Ministry for Potable Water and Sanitation had a close relationship with the Santa Cruz cooperatives. The capability of the Santa Cruz

[29] Field notes, Cochabamba, 2014.

Federation of Water Cooperatives to obtain infrastructural projects from the state was apparent at all levels ranging from officials at the ministry to the Santa Cruz branch of the AAPS and members of the Santa Cruz federation. The absence of a municipal provider in Santa Cruz and the capability of cooperatives to create links with the central state have strengthened such organisations and improved their relationship with the state.

> Ah, that is normal with SAGUAPAC [the larger cooperative in Santa Cruz]. With FEDECAAS [Federation of Water Cooperatives of Santa Cruz Department], we have a totally good relationship. They ask for various projects. Their mayor is also very available. We have found funding for over US$15 million for them with the Germans (*Vice Minister for Potable Water and Sanitation, 19/08/2014)*

Santa Cruz cooperatives have thus successfully presented themselves as a legitimate recipient of funding. Furthermore, they have been able to do so while remaining partially autonomous from party politics (interview with a consultant for sanitation project, 06/12/2013). In fact, the cooperatives have established a good relationship with the often politically opposed national state authorities as well as the local authorities of the Santa Cruz department. The president of the Federation of Santa Cruz Water Cooperatives has indicated that their positive relationship with the state is a relatively recent development, and its improvement was due to their capability to organise in a federation (see Chapter 6). Therefore, the political power of the cooperatives and their relationship with the municipality is seemingly fundamental to their ability to receive projects.

In sum, certain levels of the state attempt to delegitimise cooperatives by framing them as private institutions, but this perspective varies by state level. Additionally, state and local authorities often mediate the cooperatives' ability to receive funding. The decision of state authorities to provide the service is mainly political in nature and dependent on their ability (or lack thereof) to directly control the waterscape and the service as well as the capability of communitarian organisations to exercise power. This issue raises the question of how cooperatives could contribute to the discourse at various state levels, which is the topic of the following chapter.

5.3. Direct modification of the material waterscape by the state

The previous sections have explained the impact of the shape of the waterscape (i.e. the presence of different, fragmented waterscapes) on the action of state authorities and their conception of communitarian providers. Now, this section analyses the contribution of state actions to materially influencing the waterscape. I specifically argue that the state's conception of the hydro-social territory influences the construction and modification of the waterscape.

Consideration of the state's infrastructural projects is fundamental to understanding its political aims. According to Webber (2016, p. 1866), infrastructural projects are critical for the Bolivian state and usually viewed in communitarian organisations as the main exchange between the community and state. Therefore, it is imperative to analyse the execution of projects in the water sector in order to determine the politics and aims of the Bolivian state as well as its influence over the conurbation.

The state physically modifies the waterscape in the conurbation in two main ways. The first is through the construction of large-scale infrastructure, as the next subsection explains. The second is through the territorial expansion of the municipal water network, which is covered by the second subsection. Both contribute to making the waterscape more knowable and ordered as well as enhancing the control of the state. Large-scale projects, such as the Misicuni dam, which should become the main source of water in the conurbation, simplify control of the waterscape. Large providers, such as SEMAPA, can thus be less dependent on finding new sources, which requires lengthy negotiations with rural users and communities. The expansion of the municipal network also extends the control of the municipality and increases the uniformity of the waterscape.

5.3.1. Large-scale projects

The main method by which the national state can shape the physical waterscape of the conurbation is the construction of large-scale infrastructure. The effect of such projects on

smaller providers is often inadequately considered (see Chaper 6). Additionally, there is scarce attention to the sustainability of communitarian organisations in the Bolivian state water politics. These two facets of the national state water policy seem to favour an imagined 'ordered' urban waterscape, which is improved through large-scale infrastructural projects.

The Bolivian state currently controls water and sanitation projects through a centralisation of international funding, which is another configuration that imparts power to the state**.** Water-related projects are largely financed by international cooperation agencies and international financial institutions, such as the Inter-American Development Bank (BID). Foreign donors and financers coordinate with the Water and Environment Ministry through the Group of Cooperation in Water and Sanitation[30] with the aim of maximising the results of investments. Projects are then usually executed through Bolivian state agencies (interview with an official from the Ministry for Water and the Environment, 21/01/2014). Outside of the Ministry for Water, the Ministry for Planning and Development is operating a large campaign for small-scale providers (MIAGUA). However, such projects have focused mainly on rural areas[31].

In urban areas, the focus of the ministry seems to be the construction of large-scale infrastructures. Such attention is reflected by the institutional transformation of the Ministry for Water. The Ministry for Water and the Environment has identified EMAGUA as the agency that is charged with carrying out water and sanitation projects. The agency has grown impressively since its foundation in 2009 and opened departmental branches, including one in Cochabamba. It concentrates on designing projects and building infrastructure.

A focus on large-scale infrastructure is also obvious in Cochabamba, where discussions regarding the water sector have centred on the Misicuni dam, which is often cited as the solution for persistent water problems of the conurbation. The Misicuni project is intended to provide water, including for irrigation, to the entire conurbation. However, the means of

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[30] http://www.aecid.bo/portal/2011/10/19/agua-el-grupo-de-cooperacion-de-agua-y-saneamiento-gras-se-reunio-en-la-otc-de-bolivia/ (accessed in September 2016).

[31] A few projects have been carried out in peri-urban areas of the Cochabamba conurbation. These projects are mainly aimed to build new systems were none exist, and not to support existing water system.

water distribution and its cost have not yet been established. The emphasis on the building of infrastructures correspond to fewer resources for the support and improvement of the water providers who will ultimately administer them. In view of this, some academics who I interviewed had come to question the sustainability of such projects. In general, communitarian providers in peri-urban areas receive little attention and support.

> The politics of the state should be coupled with a process to help small committees, cooperatives. So that they could give (the service) because it was known that they could not provide it at the level that it was required, right? All the formalisation started with this logic. It was a logic of introducing the state as a guarantor of this quality through regulation. But to say the truth, I have not seen much progress in this area, right? (…) on the issue of the control over the quality of the service, and to strengthen their organisational, technical … what do I know … capacity to improve the quality of the service, right? But, really, up until now, there have been not many results in this area, right? (*Rocio Bustamante, 27/11/2013)*

My respondent from the state agency SENASBA also confirmed the scarcity of attention to sustainability and the focus on infrastructure development[32]. As an agency of the Ministry for Water and the Environment, SENASBA is charged with improving the sustainability of water providers. During my time in Cochabamba, SENASBA was the only agency that had built a relationship with FECOAPAC in order to start a project to capacitate peri-urban cooperatives. Nevertheless, this project was an exception rather than the rule for Cochabamba's cooperatives. My respondent in this agency stated that state projects – especially those financed through international loans – focus mostly on large infrastructural projects. A 'community development' element is commonly attached to such projects, although it is usually considered as a secondary issue. The relatively low priority of communitarian development in the water sector is also evident from the low budget reserved for SENASBA.

[32] Officials SENASBA, La Paz (second interview, 20.08.2014).

Furthermore, projects aimed to bring water to peri-urban areas, do not necessarily strengthen communitarian providers. An example is the EU-funded project Program for Water and Sanitation in Peri-urban areas (PASAP) aimed to improve water access in peri-urban areas. In Cochabamba, extensions of water and sanitation services seemed oriented towards the centralisation and municipalisation of water provisions (Walnycki, 2013) rather than strengthening communitarian providers. A focus on large-scale projects in urban areas in combination with scarce attention to sustainability and support for small-scale organisations, therefore, results in an overall neglect towards peri-urban organisations. Furthermore, the focus on large-scale projects reinforces the power of the state and of the municipalities over the waterscape (as it will be examined in more details in Chapter 6).

5.3.2. Expansion of the municipal water provision network

Municipalities have a central role in determining the relationship between peri-urban communities and the state. The municipality exercises considerable influence over water governance through its ability to control the state's flux of resources and projects, control the waterscape and materially provide the water service.

My interviews with state officials indicated that most municipalities sought to reinforce their ability to directly provide the service, influenced by an ideal hydro-social territory where provision is guaranteed by a universal provider. Section 5.2.2 discusses how the municipalities utilise LLP funding to strengthen their control over the waterscape. In the current sub-section, I focus specifically on the municipalities' expansion of their control over the waterscape through the development of the municipal water and sewage network. I consider how the focus on network expansion could have implications for the relationship between communitarian providers and municipalities. I emphasize how the municipality does not exercise an uncontested control over the waterscape. The expansion of the network reinforces the state's control over the waterscape but must be negotiated with communitarian providers. Furthermore, even when the municipality controls the network, it does not reserve complete control over the waterscape.

I interviewed representatives from the basic sanitation units of three municipalities that lack a municipal water provider. Respondents from all three units reported an intention to create a municipal provider and, therefore, to reinforce the direct control of the municipality over the waterscape. However, agreements with communitarian organisations that currently manage the water service would clearly be necessary in all three cases, underlining how the control over the waterscape and over the hydro-social territory is not absolute. Each municipality negotiated this necessity differently.

Respondents from both Tiquipaya and Colcapirhua acknowledged the requirement to receive the consent of a communitarian organisation to include their networks in either a municipal or conurbation-wide provider. They considered negotiation with them to be a necessity. Respondents from Tiquipaya explained that there was an idea to build a municipal water company, which could perhaps be achieved by securing the agreement of communitarian providers in exchange for allowing them to retain part of their control.

The respondent from Colcapirhua shared a proposal to build a municipal company for only the sewage service. He also discussed the possible construction of a conurbation-wide water company, the construction of which has been discussed in the conurbation with the aim of administering the water from Misicuni. My interviewee stated that if such a provider were to arrive in the municipality, communitarian providers could pass their networks to it in order to receive water from Misicuni. These answers reflect a vision of the future in which the state reinforces its presence in the waterscape. However, they also demonstrate that communitarian organisations exercise a certain amount of control over the shape of their waterscape, and over the capability of the municipality to modify it, and the need for their agreement and a possibility for refusal were taken into consideration.

Meanwhile, my interviewee from the municipality of Vinto proposed another model for waterscape management whereby communities would retain a degree of control. Such a model would entail closer collaboration between the municipality and providers and lead to the sharing of power over the waterscape. This last example indicates that alternative models of governance are possible, albeit they are often hidden under legalistic discourses regarding the role of the state.

After a failed attempt to build a municipal water company, the municipality of Vinto sought to establish a collective social water company[33], which would involve the participation of communitarian organisations. At the time of my research, the municipality was discussing this possibility with the OTBs and communitarian organisations. However, the process was still in an early phase, as the municipality managed only a few neighbourhoods in this way.

While this project would strengthen the role and control of the municipality, it would theoretically leave space for communities to operate. Respondents in other municipalities did consider the possibility of collaboration with communitarian organisations, which would assign certain responsibilities to community organisations. However, my interviewee from the municipality of Vinto was the first to address it as a possible advantage. This indicated that the presence of communitarian organizations exercising some control over the waterscape was not considered as a compromise on the Vinto municipality's ideal hydro-social territory, but that their presence was included in such ideal. Vinto's example, therefore, offers an alternative way in which the role of the state would be strengthened, while still leaving some space to communitarian organizations.

Municipalities with a provider seemed to focus on expanding their networks and consolidating their control over their municipality waterscape. The growth of control in these cases was stronger and direct, and it introduced some tension with communitarian providers.

Most respondents in SEMAPA looked at the unification of provision under one provider, and therefore the extension of direct municipal control over the physical waterscape, as the optimal solution. Although SEMAPA does not have the resources to provide water to the whole municipality, the arrival of water from the Misicuni dam could change the situation. According to a SEMAPA official, ministry policy specified the construction of a unified provider in the whole conurbation because water sources are owned by the state. Therefore, it was clearly considered the most legitimate solution. Nevertheless, interviewees were aware that such a solution might encounter social opposition. They emphasised that once water from Misicuni arrives, communitarian providers can decide to receive water wholesale and thus maintain their independence. Similar agreements are already in place in certain

[33] In Spanish: *empresa de agua social mancomunada*.

areas where the SEMAPA network recently arrived. Still, not all interviewees from the municipality had a favourable view of such agreements. One respondent accused the communitarian providers of ‘profiting’ by reselling water at a higher price. However, another respondent admitted that the internal problems of SEMAPA are a factor in the refusal of committees to pass under SEMAPA’s administration.

Officials from EMAPAQ, the municipal provider of Quillacollo, also considered the creation of a municipality-wide provider to be the most suitable solution. Employees viewed EMAPAQ as the legitimate water provider in the municipality, and one stated that there is a municipal ordinance which dictates that all cooperatives should pass under EMAPAQ. He attributed social resistance to this solution to the fact that communitarian providers are earning money. Another interviewee underlined that a law that imposes the passage of independent systems under the municipality does not exists. Still, this official said that it would be more ‘correct’ if all systems passed under a single administration. In this case, the control of the municipality, or of the state, over the waterscape, was equated with its control over the waterscape through direct provision of water. Therefore, the presence of the cooperative was represented as limiting the legitimate power of the state. This conception also underlines the problem of an unclear legislation over the relationship between municipalities and water providers.

The municipal provider of Sacaba, EMAPAS, also demonstrated an aim to become a municipality-wide provider. An aim that have been supported through the equation of the municipal provider with the ‘the state,’ therefore preventing other providers from accessing state funding. As a well-established organisation, EMAPAS has grown exponentially. Officials from EMAPAS stated an objective of providing water and sewage services to the entire municipality. In practice, EMAPAS has neither sufficient resources nor water sources to achieve this aim. Nonetheless, it is evident that universal municipal provision is a strongly pursued goal. However, this growth has engendered tensions with water cooperatives.

In 1999, a municipal resolution officially transformed EMAPAS into a municipal company. It originally served the historical nucleus of SACABA and had approximately 1 000 water connections and 1 500 sewage ones. However, by 2013, it had grown by more than 10 times its size and provided water and sewage services to approximately 15 000 and 20 000

households, respectively (interview EMAPAS Manager, 30.01.2014). Through state financing from the municipality as well as projects from the national state, EMAPAS grew and improved its systems. This funding allowed EMAPAS to extend its network to unserved areas as well as add formerly independent providers to its network. Crucial to this end was the aforementioned municipal policy that restricted LLP funding for sanitation to networks that are (or will be) administered by EMAPAS. Furthermore, the municipality intends to carry out a large-scale project (the PALCA project) to deliver water to the Sacaba municipality, which would yield a larger water supply for the municipal provider and might equip it to provide water to the whole municipality. This use of state funding thus strengthened the municipal provider's control over the waterscape while weakening independent providers.

Municipal officials underlined that they did not wish to take over independent systems, and they considered it their duty to give them technical assistance. However, the expansion of the network of EMAPAS caused tensions with the cooperative of District 2. At the time of my research, EMAPAS in fact provided potable water in District 2 in a highly limited fashion. Still, over the last 10 years, EMAPAS has strengthened its position in the district, especially in regard to sewage service provision. It built its sewage network in previously non-serviced areas and assumed management of seven small, independent sewage systems in the past seven years. One gated neighbourhood and one OTB also transferred their network from a cooperative to EMAPAS.

The penetration of EMAPAS in the district incited some conflict. Various cooperatives complained that EMAPAS had broken their pipes during its works and mentioned an absence of communication during work in their area of service.

> Well EMAPAS, in many cases ... called by the inhabitants themselves … comes to install its networks, so that we enter in a conflict because we are the one in charge of giving the service, right? (…) They came with their machines and broke our pipes, and they do not do anything. We are the ones that must repair their imprudence. We are the ones that repair. We are the ones that cover the cost. They do not do it. They come directly. They install their pipes, and they go, and they do not care if there are ruptures. We had many problems with pipes, and the inhabitants told us that they

> were the ones that did it. But in a certain way, we respect them because we want to have a good relationship with the institutions, and we do not want to have a problem if, in some cases, we cannot give the service. They give the service to the inhabitants *(Interview, Administrator of Cooperative Chacacollo Oeste, 25.11.2013).*

These tensions indicate that the image of the municipal provider as the 'legitimate' provider is not consistent across the population. Thus, their ideal hydro-social territory is contested. Although their control over the territory is advancing as their network expands, the presence of cooperatives limits this expansion to some extent. My data, furthermore, suggest that inhabitants can influence the shape of the waterscape even when the municipal provider delivers the service. For example, EMAPAS was unable to exercise complete control over its territory without negotiating with its inhabitants. In one instance, EMAPAS users allowed a pilot project to install water meters in exchange for a renovation of the networks. Ultimately, both the negotiation and the project were a success. However, another large project of EMAPAS, namely a large-scale wastewater treatment plant that was funded by the Inter-American Development Bank (BID) and intended for construction in an area called Esmeralda, was blocked by the inhabitants (see Chapter 6 for further analysis of this theme). Therefore, network expansion can enhance the control of the municipality over the waterscape but does not make it absolute.

Conclusion

The material and discursive ways in which state institutions influence the waterscape are strictly connected. The representation of the waterscape as disordered and out of the state's control correlates with the statement of the state's role through legislation, which allows the state to make the waterscape more countable and knowable. Large-scale projects contribute to the objective of creating a more coherent waterscape, which is helped by the reinforcement and expansion of municipal water and sewage providers. The vision of a more coherent waterscape largely excludes cooperatives and other communitarian providers.

Discourses regarding the cooperatives also implicate this vision of a future ideal hydro-social territory, as they often present cooperatives as a source of disorder that will ultimately be

subsumed by larger providers. These discourses have practical consequences for cooperatives, as they are often excluded from state funding, while the enlargement of municipal systems is dependent on their capability of receiving resources and projects from various state levels.

This chapter has also highlighted differences between the vision of cooperatives at various state levels. Central state institutions are in fact more open to working with the cooperatives, but they focus on financing large-scale projects in the conurbation and engage in minimal direct contact with peri-urban communitarian providers, which justifies the need for cooperatives to establish links with central state agencies. The next chapter examines their efforts to this end.

6. Networks, scales and the construction of alternatives

Introduction

This chapter focuses on how cooperatives and the state interact within the water sector. The answer to this question, placed in the context described in the previous two chapters, allows me to understand how water governance in Cochabamba is influenced by communitarian providers. I argue that cooperatives can contest the dominant discourse of the state authorities over the future of the conurbation waterscape, both through networks which defend their legitimacy and with a discourse based on concrete examples that support the validity of small-scale solutions to the water and sanitation problems that the conurbation is facing. In this chapter, therefore, I develop my analysis with the help of the dimension of scale and of networks, and I connect them with the dimension of hydro-social territory and waterscape that were mainly used in the two preceding chapters.

In the first section, I focus my analysis on the dimension of scale and its impacts on the power relations between the state and the cooperatives. I argued, in Chapter 5, that the construction of large-scale infrastructures is one of the main goals of the Bolivian government. In this chapter, I analyse how various levels of the state are pushing for 'large-scale' solutions to the problem of water in the conurbations through the construction of large-scale infrastructures. I expand on how these infrastructures influence, or are expected to influence, the cooperatives (and other communitarian providers), and how the cooperatives react to such projects.

In the second section, I focus on the dimension of network. I first analyse how informal networks built within the cooperatives allow the latter to shape discourses that contest the municipality's conception of the cooperatives as 'private' organizations, and how this shapes their relationship with the municipalities. Such networks are based on how the members of the cooperatives see their waterscape, to say on their capability to build a hydro-social

territory (as analysed in Chapter 4). This allows me to underline how the construction of shared hydro-social territory in the cooperatives relates to their capability to contest discourses and governance models pushed by the municipalities. I further analyse the role of formal networks in propagating such discourses in front of the state. More specifically, I examine the Federation of Water Cooperatives of the Cochabamba Department (FECOAPAC) and its attempt to influence different levels of the state, by pushing for a political discourse that acknowledges the legitimacy of the cooperatives as a recipient of state funding and as a valuable part of the future waterscape of the conurbation, underlining the validity of small-scale solutions.

In the third section, I analyse the case of the construction of a small-scale waste water treatment plant (WWTP) for a cooperative operating in Sacaba District 2. The difficulties encountered in this project allow me to underline how a cooperative was able to contest (both discursively and materially) the application of a large-scale paradigm that would have required relinquishing part of their autonomy to the municipality, with the help of national and international NGOs, and with the support of the departmental government. This example then incapsulates many of the themes of this chapter as it underlines the importance of scale, both discursively and materially, the importance of building networks at different scales, the necessity of looking at different levels of state as 'different sovereigns' with somewhat differing political objectives and the importance of the discursive and material control over the waterscape that a cooperative can exercise.

6.1. Large-scale projects: discourses, material effects, and resistance

This section focuses on the consequences of large-scale infrastructural work in water governance, and specifically on how they influence the relationship between communitarian providers and the state.

The policy of the Bolivian state has been focused on the construction of large-scale infrastructures in the conurbation. The construction of such infrastructures is accompanied by the attempt from the part of the state to push water governance at a higher scale, through

discourses of scale (i.e. discourses over the scale at which water governance should be carried out). Attempts to modify water governance through large-scale infrastructures can be interpreted as an attempt to make the waterscape legible and ordered (as discussed in Chapter 5), as well as to expand the control and power of the state over the waterscape. However, different levels of the state have different visions on how governance should take place, and contrasts emerge due to the attempt of different levels of the state to exercise control over the waterscape.

As a consequence of the construction of large-scale infrastructure, communitarian organizations are at risk of losing part of their independence. This is not only due to the physical modification of the waterscape brought by large-scale infrastructures, but also to the hydro-social territory pushed for by the state. Such hydro-social territory is marked by the idea that the growth of control of the state through a universal service provider is eventually or nearly inevitable. The effect of such infrastructures on the shape of water governance in the conurbation is therefore often presented as a techno-economic or legislative issue, hiding potential clashes as well as specific political aims. The cooperatives resist the attempt of the state to expand its territorial control in various ways. They were able to at least partially negotiate the results of such attempts through their material and discursive control over their waterscape. Such control was reinforced with the use of networks to relate to the state.

In this section, I first look at the conurbation in general to examine what are the consequences of the dominance of large-scale water and sewage infrastructures on the model of water governance that is brought forward by the state. I analyse the case of the Misicuni project and the Metropolitan Masterplan for Water and Sanitation. This case study allows me to analyse how municipalities, the departmental government, and the cooperatives looked at the possible consequences of a project that will require building a more integrated water and sewage governance at the conurbation level. I then focus on the case of the construction of a large-scale waste water treatment plant (WWTP) in the municipality of Sacaba and specifically the consequences of such a project on the relationship between the state and communitarian water providers in the District 2 of Sacaba. This in-depth case study allows me to understand the reaction of the actors at various levels during a period in which the consequences of such project were defined, imagined, and negotiated.

These projects and the intervention of the state in the water and sanitation sector are important to the solution of the conurbation water and sewage problems. Especially for those cooperatives placed in arid areas where water is not readily available, receiving water from the Misicuni dam was long-awaited for, and the construction of the waste water treatment plant of Sacaba is necessary to prevent the progressive degradation of the conurbation environment. The discussion, however, lies in the way in which the agreements over access to these infrastructures take place, and on the consequences of these agreements. The issue, therefore, touches on the question of democracy in water governance, as it pertains the question of who, how, and in which ways makes decision over the waterscape.

6.1.1. Large-scale projects and hydro-social territories in the conurbation

I argue in Chapter 5 that large-scale infrastructural projects are central to the Bolivian state policy on water and sanitation provisions in urban areas. The most prominent project in the conurbation is the building of the Miscuni dam and related infrastructural works. Its consequences on the conurbation's hydro-social territory and waterscape are examined in this sub-section.

The Misicuni dam has long been looked at as the solution to water scarcity in the Cochabamba Valley. The arrival of water from the dam will strongly affect the material waterscape of the conurbation. This change of the material waterscape also engendered changes in the hydro-social territories. Specifically, it produced discourses of scale, as it reinforced discourses over the need for potable service provision to be delivered through large-scale water providers. This created tensions both between different levels of the state, and between the state and communitarian organizations. Furthermore, discourses of scale were often associated to discourses that see the waterscape as 'disordered' (as examined in Chapter 5). The attempt to move institutional governance at a higher scale, in fact, is often accompanied by the idea that this would make the waterscape more ordered and fair, which emerged in the interviews with state officials. Such discourses lead to the vision that cooperatives would tend to disappear, after the large-scale projects are done.

The Metropolitan Masterplan of Cochabamba (PMMC, 2013) is an example of this attempt to order the waterscape and to organize water management at a higher territorial scale, and of the connection of such attempt with the construction of large-scale infrastructures. The report that accompanied the masterplan offered a detailed diagnostic of water and sewage provision, services, and production in the conurbation. Its analysis and proposals for the future of water provision in Cochabamba hinged on the Misicuni dam, which, it estimated, would provide 71% of water in the conurbation (PMMC, 2013, Resumen Ejecutivo, p. 41). The PMMC explicitly underlined that such a large-scale infrastructure would alter the geographical scale at which water governance needs to be carried out, making it necessary to create organizations able to work at the conurbation level.

> A paradigmatic change that the Metropolitan Masterplan proposes through the Misicuni project, is precisely a metropolitan vision of water and sanitation services, with a mission of service that cover the seven municipalities of the valley, and that will benefit all the population without any distinction of place, zone, or municipality. Misicuni, therefore, becomes the driving force for the improvement of the quality of life and the development of the region, creating space of dialogue and integral understanding amongst all the actors of the region *(PMMC, 2013, Resumen Ejecutivo, p. 99)*[34]

The Metropolitan Masterplan suggests the need to establish a Metropolitan Water Company operating at the conurbation level to distribute water from Misicuni (PMMC, 2013, Resumen Ejecutivo). However, how such a company would work and what competencies it would have is not clear, and it has been the subject of debate between levels of the state. Such debates are connected with the strengthening of the control of different levels of the state over the waterscape. This indicates that there are differences in the vision of the hydro-social territory at different levels of the state, and that questions of scale create tensions not only between the state and the cooperatives, but also between different levels of the state.

The consolidation of a Metropolitan Water Company has been considered particularly important by departmental government officials, which deem it fundamental for the solution

[34] Translation mine.

of water issues, conflicts, and contamination in the conurbation. This indicates the existence of a link between discourses of scale and the vision of the waterscape as disordered. Departmental officers in general stressed the importance of creating a more coordinated water and sanitation governance at the conurbation level, involving both communitarian organizations and municipal water providers. An official of the Unit for Basic Sanitation related that the ideal solution would be the planification and integrated management of water and advanced the idea of transferring management (or at least to coordinate the management) of all water sources (not only Misicuni) at a metropolitan scale, arguing that a centralized management would bring equality of provision and prices in the conurbation, as well as reducing water conflicts. Such centralized management would then concentrate the material control over the waterscape at a higher territorial level, and it was described by a departmental official as an occasion to build a just waterscape.

> For this reason, we believe that, when an authority is established that control water sources, as it could be Misicuni, such authority should, in the future, start assuming control over all the water sources, and should administer all water sources. Because these sources are not of the cooperative and are not of the water committees. They are of the state, and the state should give this service *(Interview, official Unit for Basic Sanitation, 15.07.2014)*

Such a project, however, would mean weakening the control that territorial organizations, municipalities and communitarian organizations alike, hold over the waterscape. Departmental officials therefore underlined the difficulties of such endeavours.

Questions over who would control the material waterscape of the conurbation and, in particular, who would control water coming from Misicuni, was a source of contrast between different levels of the state**.** After I left the field, specifically, disputes over who should be in charge of such Metropolitan water provider occurred between the municipal provider of Cochabamba (SEMAPA) and the departmental government. The municipality of Cochabamba considered, in fact, that SEMAPA could be transformed into a conurbation-wide provider, while the departmental government encouraged the formation of a new provider. Such a new provider would be shaped by the Metropolitan Council, formed by the

seven municipalities of the conurbation and the Departmental Government (Los Tiempos, 2017b).

The construction of the Misicuni dam, therefore, strongly changed the material waterscape of the conurbation and created tensions over the hydro-social territory that would emerge as dominant. Such tensions and uncertainty also influenced the relationship of the cooperatives with the state. At the time of my research, it was not clear how water from Misicuni was to be distributed specifically to communitarian organizations, and what the effects of receiving this water would be on their capability to maintain independent systems. The Metropolitan Masterplan indicated that communitarian providers could receive Misicuni water through a municipal provider (or the municipality[35]) (PMMC, 2013, Resumen Ejecutivo, p. 100-106), however, how that would take place was not clear.

At the time of my research the more advanced planning concerned the need to bring water to the arid South Zone, leaving open the decision to the communitarian providers to either pass to SEMAPA or to receive water wholesale. The head of the cooperative Primero de Mayo (South Zone, District 9) relayed that they hoped to receive water from Misicuni, but he was doubtful that any would arrive before 5-7 years. He strongly underlined that they wished to remain independent (interview, 21.11.2013). However, in other areas of the conurbation the effects of the arrival of the Misicuni water on the cooperatives was not as clear. A respondent of a cooperative placed in the north side of Cochabamba affirmed that they had been told that they could receive water but seemed in doubt over what the consequence of accepting water from Misicuni would be, to say he thought that accepting the water might mean that they needed to pass their administration to SEMAPA.

While state interviewees often remarked that they did not wish to force the cooperatives to cede their networks, they often saw the arrival of Misicuni as a probable cause of the end of the cooperatives. The construction of large-scale water infrastructures is then seen as having effects on the scale at which water provision should be carried out, to say: it produces discourses of scale. Such an effect was often described by state interviewees as a natural

[35] In Tiquipaya, where a municipal water provider is not present, the unit of basic sanitation intended to treat water through a municipal potabilization plant, and then distribute it to some providers (Official Unit for Basic Sanitation, Municipality of Tiquipaya, 26.05.2014).

consequence of the arrival of Misicuni, and not as a political choice. They underlined that the cooperatives could maintain a separate administration, if they wished to, but seemed convinced that it was probable that they would be absorbed by a larger entity. They often underlined the need of communitarian organizations to organize and to improve their service. However, cooperation and resources that the communitarian organizations would need to carry out such improvement were not provided by the state. In the imagined hydro-social territory of many state respondents, therefore, the cooperatives were a stepping stone towards the aim to provide a universal water service, as well as inherently weak organizations. The consequences of the arrival of Misicuni on communitarian providers, therefore, were often considered in technical and economic terms, and not as something that needed to be subjected to political discussion.

Large-scale projects can then produce negative consequences for communitarian providers, not necessarily through their exclusion from connection with the infrastructure per se, but through neglect and exclusion from state resources. For communitarian providers, in fact, a discourse based on the necessity for 'large scale' infrastructures, could lead to the idea that the existence of the cooperatives themselves is not useful, and that their disappearance is inevitable. The question is, then, the capability of the cooperatives, and other communitarian providers, to be accepted as a legitimate part of a future landscape, that should be nurtured, and not allowed to simply waste away.

How the cooperatives negotiated and partially resisted the effects of such large-scale infrastructures is investigated in the next sub-section, as I analyse the case study of the construction of a large-scale waste water treatment plant in the Sacaba Municipality.

6.1.2. Case study on the effect of large-scale projects on the cooperatives: Municipal Waste Water Treatment Plant District 2

This sub-section explores how cooperatives were able to partially resist the expansion of the municipal control over the waterscape caused by the project to build a large-scale waste water treatment plant (WWTP) in the municipality of Sacaba. This resistance was made

possible by the material control that the cooperatives exercise on their waterscape and by the use of a network organization (FECOAPAC).

The construction of this WWTP is part of a general growth in attention over waste water treatment both at the conurbation and at state level. In the conurbation, attention has been paid specifically to the contaminated River Rocha, which was declared an environmental disaster in 2012. This growth in attention was accompanied by an attempt from the state to increase its control over the waste water which passed through the construction of large-scale infrastructures and to an attempt to regulate much more strictly the organizations that discharge waste water. Waste water, then, is involved in the growing expansion of the state control over the waterscape, through large scale infrastructures and stricter regulations.

The problem of waste water has grown during the years due to lack of state-provided sewage systems in peri-urban areas as well as lack of adequate waste water treatment. As with water provision, the state never had a complete control over wastewater production, channelling, and discharge. At the time of my research, the only functioning large-scale WWTP was Alba Rancho, managed by SEMAPA, infamous in the conurbation for the bad smell it produces. The plant was built in the 1980s and had not been properly maintained for years, as was considered by SEMAPA as a secondary problem, indicating the process by which the state lost control over the conurbation waterscape. In the last years, maintenance has greatly improved, but the fundamental problem remains that the plant has not kept up with the expansion of the city, thus receiving more water than it can treat (SEMAPA official, field notes, 11.06.2014).

The solution offered by state officials for the pollution problem was based on large-scale infrastructural work and the strengthening of the state control over the waterscape**.** The Metropolitan Masterplan points to the construction of large-scale waste water treatment plant (WWTP), under the management of the municipalities, as the solution for the contamination problem. A project to enlarge the Alba Rancho plant, financed by the Andean Development Corporation (CAF), was slated to start soon. Various municipalities elaborated projects to build their own plants, but the municipality of Sacaba was the only one that had a financed project ready to start at the time of my fieldwork.

Building WWTPs in the conurbation is a serious challenge. The difficulties encountered emphasize how state authorities do not have a complete control over the waterscape, and often need the consent of communitarian organizations to be able to carry out infrastructural projects. Interviewees in the municipalities underlined the difficulty in finding adequate space to build a plant, due to the uncontrolled growth of the city, the high cost of land, land speculations and the opposition of the inhabitants. Most interviewees underlined that inhabitant opposition was due to the example of Alba Rancho.

These difficulties emerged also in Sacaba. The municipality received financing from the state for the construction of the two large-scale WWTPs, called El Abra and Esmeralda. The project of the Esmeralda plant dates from 2008 but had been stopped due to prolonged social conflicts with the inhabitants of the area (Los Tiempos, 2013). This represents a clear example of the fact that the municipality does not have complete control of the waterscape and needs to negotiate with the inhabitants to carry out infrastructural works.

The situation was different for the plant of El Abra, that would purify the wastewater coming from the District 2 and 6 of Sacaba. The construction of the Plant of El Abra had just started at the time of my research and the project was looked at positively in District 2 where most interviewees acknowledged the necessity of a plant. While, however, the building of the plant *per se* has not been opposed, the tensions between the cooperatives of District 2 and EMAPAS; as well as between different actors in the district, made it so that it was unclear how waste water would be canalized to the plant at the time when works where due to start. In fact, various cooperatives in the district feared that they would be pressured to pass their sewage system to the municipal provider. Therefore, tensions regarding the construction of the WWTP are in fact tensions caused by the growing control of the municipality in the waterscape, and the resistance of the cooperatives to such growth. The construction of a large-scale infrastructure, therefore, changes power relations in the waterscape, and, in this case, was perceived as a risk for the control of the cooperatives over their sewage network.

District 2 is provided with its sewage service not only by EMAPAS but also by the cooperatives. Tensions over the control over the waterscape were already present before this project started, especially concerning the construction of a municipal sewage service. Some cooperatives complained that EMAPAS did not respect and often damaged their networks,

causing EMAPAS to be seen as an arrogant entity, that aimed to take over their networks. The progressive entrance of EMAPAS in the district, helped by the municipal decision to cut cooperatives and OTBs from municipal funding (see Chapter 5), was often seen by communitarian providers as an attempt of the municipality to take over.

Furthermore, the cooperatives had been subjected to growing legal pressure, concerning their wastewater discharge, a symptom of the stricter control of the state over wastewater discharge in the conurbation waterscape. Most wastewater in District 2 is discharged with little treatment in the River Rocha. Most cooperatives use Imhoff tanks, which provide very basic treatment and are often malfunctioning. The Departmental Environmental Agency (the main environmental authority in the conurbation) started to supervise polluters and started administrative processes that could lead to sanctions. Cooperatives were left scrambling to improve their waste water treatments. These legal procedures exasperated certain respondents, that saw it as an unnecessary pressure from the state. Some of my interviewees believed this pressure was aimed to force them to pass their sewage network to the municipal providers, or at least to force them to connect to the EMAPAS plant. They saw these inquiries as unfair, as they alleged that the municipality was currently polluting the river Rocha more than they were. The situation further worsened when letters notifying various cooperatives that a separate inquiry had been opened over them by the *Fiscalia del Estado* (office of the public prosecutor), due to their wastewater discharge in the Rocha River.

Such persistent pressure led to a response of the cooperatives. In this case, they organized to mediate with the state through a network. The cooperatives quickly allied with each other and contacted the FECOAPAC to try to solve the problem. However, it was also remarked that they were capable to defend their waterscape materially if needed. The president of one cooperative was particularly frustrated and asserted that it was ‘all politics’ and a way to force the cooperatives to pass to EMAPAS. He also argued that if the state kept pushing this way they would risk the members of the cooperative taking the streets (field work notes).

FECOAPAC was able to ask the Departmental Environmental Agency, as well as the Unit for Basic Sanitation of the departmental government to mediate this conflict. Different levels of the state, in fact, might have different visions of the waterscape. The departmental government officials, while pushing for a more ordered water governance in the conurbation,

often expressed a more positive vision of the role that communitarian providers could play in such governance compared with municipal officials. While it was clear that departmental officials saw very positively the project of EMAPAS, they underlined that they did not wish to damage the cooperatives.

> We are trying to reach a solution that will be beneficial also for these seven cooperatives that have a problem with the public prosecutor office (…) We do not want to, it is not our intention, that the cooperatives disappear. On the contrary, we know that they are good for society. We do not want to take away from them the management of the sewage system (…) Our objective is to solve the problem of the Rocha River. If for that to happen, they need a more healthy and close relationship with the municipal provider, then is what needs to be done, right? *(Interview Official Environmental Unit, 11.08.2018)*

In order to solve the legal problems, a meeting was organized between the cooperatives involved, the Environmental Agency, FECOAPAC, and EMAPAS. FECOAPAC obtained consensus that all cooperatives would connect to the treatment plant. However, FECOAPAC obtained an agreement that state financing for the construction of waste water collectors and macro-meters necessary to pass the waste water to the municipal plant were to be found (interview president FECOAPAC, 12.08.2014). Relating with the state through a network, therefore, was at least a partially successful strategy. However, even after the meeting what would happen was not completely clarified. When I concluded my fieldwork, the cooperatives and EMAPAS had still not reached a clear agreement, and there were still some fears that the municipality might push to take control of the cooperatives' sewage networks. Respondents remarked that the sewage was owned by the them, and that they would not be willing to pass it to the municipality, underlining the sense of ownership of the cooperatives over their waterscape.

> It is clear that the cooperative … we cannot give them, to say, we cannot pass to EMAPAS. The cooperatives, all that we have installed it came from our sacrifices, there can be an agreement only for the treatment of water but nothing more (…) This [agreement] is under study (…) We did not sign it, we are waiting for it (…) For the moment we will not do anything, because right now we cannot talk about anything

> yet, because we do not know very well. They did not start building the plant yet, when it will be finished then afterwards we are going to see these points, and how to measure, and what would the agreement be (...) *(President Coop. Quintanilla, 10.09.2014)*

While in this case, the presence of FECOAPAC, as well as the mediation of Departmental authorities allowed the cooperatives to obtain some protection for their systems, along with some concessions, the imagined hydro-social territory of the municipality was able to impose itself, acknowledging large scale municipality-controlled infrastructure as the solution to the pollution problem. However, the existence of the cooperatives limited the control that the municipality was able to exercise on the territory. This example underlines how discourses on scale (in this case, discourses on the appropriate scale at which waste water governance should be administered) have real consequences on how the waterscape is built. It also emphasizes, however, how the cooperatives can at least partially modify these discourses and plans. Furthermore, at least one cooperative disassociated from the agreement between FECOAPAC and the municipality. The decision of this cooperative to create their own waste water treatment plant constituted a small but noticeable break in the municipal vision of the scale at which waste water governance should be carried out (this example is examined in Section 6.3).

6.2. Contesting state discourses: the role of networks

Section 6.1 underlines the cooperatives' need to employ discourses that resist stronger state discourse. State discourses are not homogeneous, but they tend to present a universal water and sewage system as the ideal model of provision. This section examines in more detail how discourses and resistance are produced and employed. To this end, I focus on the 'dimension' of networks. I focus on understanding how networks, built at different levels (e.g. community level, departmental level), develop discourses that influence or contest the state's hydro-social territories, and therefore the constructions of the waterscape.

The capability of the cooperatives to elaborate alternative discourses starts from their relationship with their members, to then attempt to influence governance at higher scale.

They can therefore be interpreted as a way to democratize water governance. The importance of a democratic participation or the democratic nature of the cooperatives was barely mentioned by state officials. They, in fact, considered the rights of inhabitants mostly in the context of access to service and not in the right to shape the service. Overall, they did not address the benefits of user participation in water governance and primarily situated the voices of inhabitants in relation to resistance to state projects. In this case, they identified the necessity for discussion but not the need for continuous participation. Therefore, legitimate questions arise on the democratic nature of governance in Cochabamba, pointing to the importance of communitarian organizations for the capability of the inhabitants to exercise their rights to the city.

I start by analysing the reasons of the cooperatives' resistance to become part of the municipal network, and how they represent their role in relation to the state. To do this, I need to look at the informal networks which are formed within the cooperatives through shared history, and how these networks allow the cooperatives to form defensive discourses to oppose the way in which cooperatives are represented by the municipalities. I then look at more formal networks that are used by the cooperatives to enhance their capacity to shape discourses on water governance, and, more generally, their capability to interact with the state. To this end, I focus on FECOAPAC and on how this organization have been able to influence state policy at different levels. Looking at the operation of both FECOAPAC and the Santa Cruz federation, I underline how the objective of the cooperative's network is to obtain the collaboration of the state in providing the water and sewage service. The cooperatives, then, need to present themselves as legitimate recipients of state funding and support and, more generally, as a legitimate part of the urban waterscape. To this end, the cooperatives interact with different state levels, taking advantage of the fact that state discourses on the cooperatives are not the same in different levels of the state.

6.2.1. Contesting discourses: creation of the cooperatives discourse

Before focusing on the relationship between cooperatives and state, it is important to understand the discourse that the cooperatives use to contest the state, and to defend their autonomy**.** This is necessary to understand the connection between the lived history of the cooperatives, their shared hydro-social territory and the way in which they relate to the state.

In short, I am going to underline how the shared hydro-social territory of the cooperatives, formed through informal networks of inhabitants of their neighbourhoods and their communal experiences (analysed in Chapter 4) influence the way in which they relate to the state and how they see their future.

Further, I focus on the relationship between cooperatives and municipalities, and how their continuous interaction during the history of the cooperatives also contributes to shaping the way in which cooperatives represent themselves and the municipalities, and, therefore, the way in which they see and imagine their hydro-social territories.

Municipalities often define the cooperatives as 'private' and even 'for-profit' organizations, as well as criticizing the sustainability and quality of service (as examined in Chapter 5). Many state interviewees look at communitarian water providers as fragile organizations that will disappear to leave space for a universal municipal provision. As underlined in Chapter 4, some of these criticisms are justified as these fragilities are real, however they are compounded by the refusal of the state to collaborate.

The cooperatives' resistance to the state is based on their shared hydro-social territory built through their lived history. Through the informal networks that developed though the history of cooperatives, the members of the cooperatives were then able to contest the hydro-social territory of the municipalities. Cooperatives' resistance to discourses that posit them as 'stepping stones' to a universal municipal service, can be explained by the fact that the cooperatives are owned and controlled by their community, since they were built through the 'sacrifice' of the inhabitants. This engendered a feeling of ownership over the waterscape. Furthermore, the cooperatives contest the discourse of the municipalities, which essentially posits that a universal service provider would deliver a better and more fair service, by pointing out that the service could worsen under a municipal provider. Cooperatives respondents underlined that joining the municipal service will result in a loss of independence in decision-making (especially concerning prices). As a result, respondents feared that the service would become more expensive under the municipality. Some respondents also feared that 'their' water would be used for a larger waterscape, diminishing supply. The strong connection between the cooperatives, community, and space was also used to criticise municipal providers. Differently from the cooperatives, in fact, municipal

providers are often seen as ‘absent’ from the waterscape. The fact that EMAPAS workers came, installed the sewage service, and then disappeared was underlined by one interviewees, that explained that cooperatives were sometimes called to solve problems of the municipal sewage pipes.

Some respondents associated with the cooperatives turned the municipalities’ criticisms on their head by questioning the economic sustainability and quality of service offered by the municipalities, therefore contesting the discourses used by the municipality to support their vision of an ideal hydro-social territory. Those cooperatives that offer a continuous service usually asserted that their service is better than SEMAPA, while many underlined how their prices are lower. Not surprisingly, therefore, when asked, if they think they would pass to the public provider, most respondents rejected the idea outright, while a few asserted that it would be the decision of the members to do so, but that they would probably refuse the offer. This rejection does not only concern those cooperatives that provide a good quality service. The representative of Primero de Mayo, that, placed in the arid South Zone, does not have access to sufficient amounts of water, underlined how they would not pass under SEMAPA, as they considered it an inefficient organization. While they do hope to receive water wholesale from SEMAPA in the future, they wish to maintain internal control (Interview with President Cooperative Primero de Mayo, 21.11.2013).

Furthermore, respondents from cooperatives contested the discourses that paint them as non-legitimate recipient of state funding. This contributes to both contest the way in which cooperatives are depicted by municipal discourses and their ideal hydro-social territory, which are often focused on producing a universal sanitation provider. The municipal hydro-social territory, as analysed in Chapter 5, is in fact often supported by the delegitimization of the cooperatives. The cooperatives contest state discourses by underlining the fact that they provided the service at a time in which the state was not fulfilling its duty. The cooperatives in Cochabamba did not develop a fully coherent discourse against their definition as private (most respondents do occasionally refer to their organization as ‘private’), like the cooperatives in Santa Cruz were able to do. However, most of them did remonstrate against the decision of the municipality to not offer support, either through the form of infrastructural projects, or the lending of machineries. There was a general sense of frustration with the lack of help from the state, as respondents underlined that they built a service that should have been the duty of the municipality to provide. Some interviewees

were keen to underline that municipal providers themselves are not sustainable, since they depended on state support, as well as LLP funding to execute their projects (see Chapter 5). In practice, an interviewee argued, it is the municipality that uses community money to extend their networks.

> There are many people that ask for an improvement of basic sanitation, and EMAPAS tell them "sure, we are going to do it, but you have to pass under the administration of EMAPAS" and I think this is blackmail, right? Because the resources of the municipality, the resources of the state, they are our own money. We pay taxes, and here they are. The fact that we are a cooperative does not mean that we do not pay taxes, we pay them all the same *(President Water and Sewage Cooperative Arocagua-Puntiti, 11.08.2014)*

Considering these issues, it is not surprising that the relationship between cooperatives and municipalities is rife with tensions in Cochabamba (especially where a municipal provider exists). These contrasts can take different forms, but they are often related to fundamental questions over who has the right to shape water governance, the municipal waterscape, and to control the cooperatives' territory and waterscape, even if they are often 'rendered technical' (Li, 2007), namely, framed in legislative and technical terms. Some of the most common conflicts relate to the growing control that the municipality is exercising on the waterscape, and the consequent stricter implementation of municipal rules and regulations. As underlined in Chapter 4, in fact, most cooperatives now operate in well-established neighbourhoods, where municipal service and municipal control, are growing. As a consequence, tensions over who has the right to control and modify the waterscape are growing.

The growth of municipal networks often resulted in complaints from cooperatives that expressed frustration over the lack of communication and a certain lack of respect to their territory and infrastructures. Communitarian providers found it difficult to get repayment for pipes broken by the municipality, and in certain cases seemed irritated by the fact that they had received no communication over works executed over their area of service.

Another kind of conflict regarded the rights of the cooperative to use the neighbourhoods 'green areas' (areas destined for communal uses such as streets, parks, etc.) to build their infrastructures. As most of the cooperatives' neighbourhoods were built outside state planning, often communal spaces were administered and used by the community, for example to build wells or water towers. However, in a few recent cases the municipalities questioned the right of the cooperatives to execute works on these lands, as they were considered owned by the state.

However, the municipality is far from asserting complete control over the waterscape, especially where a community refuses certain projects (e.g. the construction of WWTP). The municipality's hydro-social territory is, therefore, not unchallenged, especially when there is a good relationship between OTBs and cooperatives. The ownership of the land by the municipality is in fact often connected with ownership by the OTB, and, therefore, of the inhabitants.

> Yes, because if I am not wrong, the land where we asked for the authorization … because these lands are owned by the OTB, right? And thanks to the authorization of the OTB we could dig the wells, so that as I told you, the cooperative and the OTB walk hand in hand. There is mutual aid *(Manager Cooperative Chacacollo Oeste, 25.11.2013)*

Furthermore, the cooperatives are also organising in networks that allow them to defend their right to modify the waterscape. An interesting example is the conflict that emerged in the cooperative Sausalito (whose president is also the president of FECOAPAC), where the municipality intervened because the cooperative used part of a green area to build their potable water treatment plant. In this case, the FECOAPAC intervened to mediate, and to create a legal agreement that should be a model for the relationship between the municipality and the cooperatives. In this case, in exchange for the usage of the area, the cooperative provided water at a low cost to the local school.

> Due to the construction of the plant, the municipality raised some criticism on the usage of the land in the park, for all the modifications … So, we discussed the issue

> and we reached an agreement. We now have this agreement between the cooperative and the municipality. We are going to give 43 cubic meters of water for free to the school, and we are only going to charge for usage beyond that *(President of the cooperative Sausalito 25.07.2014)*

The intervention of the FECOAPAC in the Sausalito case is a relatively new tactic for the cooperatives. The strengthening of the federation and how this organization now acts as a representative of the cooperative in front of the state will be analysed in more detail in the next sub-section.

6.2.2. **Propagation of hydro-social territories at different scales**

In this section, I analyse the way in which FECOAPAC was able to connect the cooperatives with different sovereigns (municipal authorities, departmental authorities, and national agencies) and how they are attempting to change the discourse on the role of communitarian providers that dominate state policies. Therefore, FECOAPAC has been attempting to propagate its hydro-social territory at different scales, to contrast the hydro-social territory of the municipalities, and specifically how the municipalities depict the role of the cooperatives in the water sector.

FECOAPAC has a fundamental role as an intermediary between the cooperatives and the state, defending the cooperatives in conflicts with the state and working at improving their relationship with it. A particular important endeavour of the federation has been to focus specifically over the rights of the water cooperatives to receive state funding. This attempt is fundamental to create a different imaginary over the hydro-social territory from the one promoted by the conurbation municipalities. This is because it does not represent the fragmentation of the service as an issue to be eliminated in the long term. More explicitly: the imagined ‘ideal’ waterscape proposed by the cooperatives is one where different kinds of providers co-exist and co-create the service with the support of the state. After looking at how FECOAPAC operates, I will then consider the case of FEDECAAS (the federation representing the powerful water cooperatives of Santa Cruz de la Sierra), to underline how the success of such vision is based more on power relations than on legalistic or technical

arguments, and therefore the need to consider the question of democracy in water governance.

State control over the waterscape grew stricter in the last few years. From this point of view, the cooperatives need the help of FECOAPAC to mediate their relationship with the state especially concerning legal issues. FECOAPAC was first funded in 2003 but it effectively stopped working in 2005 (Interview, founder of FECOAPAC, 17.06.2014). It was then reactivated in 2009 and, at the time of my fieldwork, it had rapidly expanded to include 30 cooperatives. During my fieldwork, the federation assumed a growing role as an intermediary with the state, especially concerning obtaining documents, licences, and in general bureaucratic procedures. Respondents from cooperatives underlined the advantages of this arrangement, as when submitting their documents through FECOAPAC they received a response quickly, a fact that they argued was due to the higher 'respect' that FECOAPAC was given, whereas single cooperatives were often neglected. FECOAPAC directors also helped during cooperative's elections, as it had been recently established that water cooperatives elections were to be supervised by the state, requiring a precise application of the rules. FECOAPAC was also keen to encourage the cooperatives to register with the AAPS (the Bolivian Water Authority) and hired consultants to help the cooperatives obtain their environmental licence.

The role of FECOAPAC was also strengthened by a change in legislation. The role of the FECOAPAC underwent an officialization through the new General Law of Cooperatives, which reinforced the role of federations in conflict resolutions. Due to the new law, some respondents in the cooperatives were told by state officials that it was mandatory to be members of the federations. While it is not clear what the consequences, if any, would be for not joining the federation, these instances underlined the growing legitimacy of this organization in front of the state. While help from FECOAPAC is positive, these changes indicate the progressive bureaucratization of both cooperatives and FECOAPAC, and more stringent regulation from the state. FECOAPAC has accepted certain aspects of the hydro-social territory of the state, by helping with the 'ordering' of the waterscape. However, this does not mean that the federation has not contested certain other aspects of the state's hydro-social territory, especially at the municipal level.

The relationship between the federation and the state is somewhat ambiguous. The FECOAPAC aims to collaborate with the state, but also depicts itself as a 'defender' of the cooperatives in front of the state. Such ambiguity is reinforced by the fact that different levels of the state have different visions of the cooperatives. Therefore, the role of this network is alternatively to reinforce the hydro-social waterscape of the cooperatives through legal discourses, to achieve collaboration with state authorities to help the cooperatives reinforce their waterscape, but also to defend the cooperatives against attempt of the state to penetrate in their waterscape. Therefore, while the FECOAPAC president asserted that they were building a relationship based on collaboration and respect with the authorities and that they have worked to improve their relationship with the municipalities, FECOAPAC representatives also often need to represent the cooperatives when conflict arises with state authorities (usually the municipalities). Furthermore, the FECOAPAC had been able to create connection with national agencies, such as SENASBA, from which they had been able to obtain one project. They had also started to research the possibility to obtain funding from the international cooperation and, more in general, were trying to create links with national agencies so to be able to obtain projects to support the cooperatives.

FECOAPAC then worked to elaborate on discourses to defend the cooperatives, strengthen their legitimacy, and try to establish them as legitimate recipients of state funding. To this end, FECOAPAC mainly used legal discourses. The legal consultant of the FECOAPAC, argued that the cooperatives can receive funding from the state, since they are acknowledged as legitimate providers in the Constitution. Likewise, members of FECOAPAC often referenced to the State Constitutions, and to the Law of Autonomies, to argue that the municipality has a duty to assist the cooperatives (while municipal officers sometimes referred to this law to underline that it is the duty of the municipality to provide the service, see Chapter 5). Criticising the competence of municipal officials, leaders of the FECOAPAC often stated that municipal officials 'do not know' the legislation concerning the cooperatives.

> They [municipal officials] continue with this idea that if the municipality invests, then, it is the municipality that have to manage, because public goods, from public investment, cannot be transferred to privates, and that is not true. As I told you, there is a superior good which is the service, and administrative mechanisms are secondary

> or they must adapt to this superior purpose that is to give the service (*Interview, legal consultant of FECOAPAC, 07.06.2014*)

The president of the federation relayed the fact that they were trying to reach an agreement with the municipalities, with the assistance of the AAPS. This agreement would result in the acknowledgement that the cooperatives can receive funding. However, this was still under consideration during my fieldwork, so that I could not determine nor confirm its consequences.

> The AAPS is also going to be part of these agreements so they will have to be respected. As you can see, with what we have defined in these agreements we will work together so that the basic service issues are solved perfectly. This would be ideal. Now, in any case, this project for an agreement is going to be elaborated in the municipalities, and the federation has sent a project proposal that basically asks to follow the legislation (…) and the spirit of this agreement is that the state can invest in the renovation of infrastructures through the cooperative. (*Interview, president of FECOAPAC, 12.08.2014*)

The federation furthermore elaborated a vision of the ideal hydro-social territory of the conurbation and the role of the cooperatives in it. The ideal hydro-social territory that FECOAPAC is striving for could be considered as a co-production model. In this model, the cooperatives would progressively adapt to new state regulations that impose stronger state control, but they would also be considered as a legitimate recipient of state funding and support. However, this is a difficult endeavour, whose effects were just becoming visible at the time of my fieldwork.

The federation's president was optimistic about the future of the cooperatives and for their capability to last in time, even if he acknowledged that there were problems. Various members of FECOAPAC board of directors affirmed that there are certain institutions that might desire the disappearance of the cooperatives and spoke about the difficulties with the municipalities. The president of FECOAPAC himself complained that there is still a territorial idea that lead mayors to think of themselves as the owners of the municipalities.

He, however, argued that the municipalities do not have the capability to provide the water service to everyone, and that even the Metropolitan Masterplan acknowledges this reality. Hence, it established that water from Misicuni can be given wholesale to those that need it. FECOAPAC is then trying to challenge the discourse of the municipality, and to open state resources to the cooperatives.

At the time of my research, therefore, the relationship of the cooperatives with the state seemed to be skewed, as cooperatives were asked to adhere to progressively more stringent regulations but were not obtaining resources. In fact, the only project that the federation (in collaboration with ASICASUDD) had received was a SENASBA project for the development of technical and management capacity for 10 cooperatives and 10 ASICASUDD members. However, the president of the federation was optimistic of their capability to develop an argument that could be accepted by state authorities and underlined how the FECOAPAC had been consulted with for the elaboration of the Metropolitan Masterplan and had been able to participate in the consultation of the General Law of Cooperatives as part of the FENCOPAS (the National Federation of Water Cooperatives).

The FECOAPAC has then been able to reach some objectives, but they are far from making their discourse widely accepted, especially at the municipal level. To offer a comparison, I focus briefly on the case of the FEDECAAS (Departmental Federation of Water and Sanitation Cooperative of Santa Cruz). The powerful Santa Cruz cooperatives, were in fact, able to build a stable relationship with the state, establish their legitimacy, and receive state funding in a way that the FECOAPAC had not yet managed. This comparison is useful in order to understand that the hydro-social territory which dominates state policies in Cochabamba depends on the relative political power of the actors pushing for it. The relationship between state and cooperatives is often shaped in legalistic and technical terms but it is also strongly influenced by the political strength that the cooperatives can exercise.

This underlines once again that arguments that exclude the cooperatives from state funding or foresee their disappearance, while based on legal normative, and/or techno-economic analysis, are also political arguments and they should be treated as such. This emphasizes the need for these arguments to be publicly discussed, stressing the need for democratization and more transparency in the making of Cochabamba water governance.

The relationship between FEDECAAS and the Santa Cruz municipality is different from the one in Cochabamba. The cooperatives can access state resources and exercise more control over the municipal waterscape. This is due to the material differences in the waterscape between Cochabamba and Santa Cruz, but also illustrates how different models of relations between municipalities and cooperatives can be established, and the usefulness of networks in negotiating relationships between communitarian organizations and the state.

In the department of Santa Cruz de La Sierra water cooperatives are prominent, with the departmental federation counting, in 2014, 135 members (interview, President FEDECAAS, 07.02.2014). The city of Santa Cruz does not have a municipal provider of water and sanitation. The water cooperative SAGUAPAC supplies its water to the city centre. SAGUAPAC is the largest water cooperative in the world that offers water service to 70% of the population and sewage service to 44% (Vousvouras, 2013, p. 48). Due to the inability of SAGUAPAC to provide the service to the whole city, other cooperatives were founded. An example is the cooperative COOPLAN, founded in the peri-urban Plan 3000, and that now provide water to 26 500 households (interview, manager COOPLAN, 06.02.2014). Cooperatives in Santa Cruz are on average much larger than the one in Cochabamba. The president of the FEDECAAS estimated that an average cooperative had around 5 000 connections (interview, 01.09.2014).

The cooperatives of Santa Cruz, therefore, do not need to compete with the municipality for the control of the waterscape. They have strong control over water governance, including over the use of state resources for water and sanitation. Currently, as the president of FEDECAAS explained, they were able to obtain municipal funding for water and sanitation, and they were pushing for a percentage of municipal funding to be reserved for basic sanitation. They were also able to access funding through state projects, financed by the Inter-American Development Bank (BID) and the German agency for cooperation and development. The FEDECAAS was also at the head of the advisory committee for the Santa Cruz Metropolitan Masterplan for Water and Sanitation (interview, president FEDECAAS, 07.02.2014; interview, president FEDECAAS, 01.09.2014)

However, the situation in Santa Cruz had not always been so positive. The president of FEDECAAS affirmed that they also used to think that the state was going to take over, but

now they work together with all levels of the state (interview, president FEDECAAS, 01.09.2014). He underlined that lack of understanding with the local government is one of the main problems of the cooperatives, but in Santa Cruz even the municipality realized that the cooperatives can provide a better service than the municipality (interview, president FEDECAAS 07.02.2014). In this case, the hydro-social territory elaborated through the cooperative's network and propagated at various level of the state managed to strongly influence state policy.

The president of the federation underlined how it is fundamental for the cooperatives to receive state funding in order to control and maintain their physical waterscape. In Santa-Cruz, the service can be considered as effectively co-produced, with funding for large-scale works provided by the state, and the everyday service provided by the cooperatives. The president of FEDECAAS stated that the cooperatives were not born to front large projects, extensions, and problems connected with waste water, but that they are able to cover the maintenance and the normal operations of their cooperatives. The manager of COOPLAN similarly affirmed that the cooperatives are mostly autonomous, but they need the support of the state, for large projects. The capability of the cooperatives to establish working relationships with different levels of the state is then fundamental for their continued capability to maintain their physical waterscape.

The new favourable situation was due to the efforts of the federations and the legislative changes brought by the Morales government. New legislations acknowledge the cooperatives and underlined the duty of the government to provide the service. FEDECAAS was founded in 2007, specifically to assist with presenting projects to the state. After the federation was established, the cooperatives were able to receive the help of professionals and technicians to elaborate on the projects, and the state started to listen to them, so that 'the life of the cooperatives changed' (interview, manager of COOPLAN, 06.02.2014).

To support their right to receive help from the state, the cooperatives of Santa Cruz created discourses over their role and the role of the state that are more coherent, and complete, than the ones employed by the Cochabamba cooperatives. The president of FEDECAAS underlined how the cooperatives are non-profit. However, differently from Cochabamba cooperatives representatives, he stated that they are public organizations.

> Yes, I tell you that the Pluri-national Constitution of the Bolivian State established that the cooperatives are water and sanitation providers, and that the municipal government must guarantee this liquid element that it is water, as a fundamental human right. The cooperatives only have to do maintenance and day-to-day management and that is what the water provider covers, and the Bolivian state in its three levels has to help, and for this we are differentiating the theme of the water cooperatives that are public-public (*president of FEDECAAS, 01.09.2014*)

The cooperatives of Santa Cruz have then been able to carve a more positive and productive relationship with the state, which reinforced their capability to control the waterscape. However, these relationships require the continuous attention of the Federation to be maintained and cultivated. Furthermore, respondents in Santa Cruz seemed aware of risk of co-option. Two interviewees underlined the need to maintain independence from political parties.

This section, therefore, underlines the importance of networks for the capability of the cooperatives to both create and propagate their hydro-social territory, starting from the relationship between the cooperatives and their members and going to the relationship between the federation and various levels of the state. Furthermore, it emphasizes how the capability of the cooperatives to be accepted as legitimate part of the hydro-social territory is fundamental if they are to maintain their physical waterscape.

6.3. Scale, Networks, hydro-social territories, and waterscape: an example of alternative governance

I finish this chapter by analysing the project of the construction of a small-scale WWTP in the cooperatives San Pedro Magisterio. The construction of such a plant emphasize how cooperatives are capable to present alternatives to the hydro-social territory elaborated by state authorities, which present large-scale WWTP as the only solution to the pollution problem of the conurbation. This case study presents an opportunity to look at how water cooperatives use different discourses to resist the state and also to examine how this resistance is made possible by their control over their territory and by their shared hydro-

social territory. Furthermore, this case study also emphasizes how different levels of the state have different visions over the territory, as different state authorities alternatively supported and opposed the project. The importance of networks to support such alternative discourses and the material transformation of the waterscape is also emphasized in this case study. San Pedro Magisterio small-scale WWTP plant was financed by an Italian NGO and supported by a local Bolivian NGO.

Finally, this case presents an opportunity to look at how cooperative members exercise their right to the city, to say their right to participate in decision-making over the shape the city should take. This right is mainly exercised on small scale, within the waterscape of their cooperatives. However, this case study exemplifies the capability of the cooperative to present alternatives to the state hydro-social territory, and therefore to influence discourses on governance at a higher scale. By offering alternative solutions to the dominant paradigm in the conurbation, the construction of small-scale WWTP underlines that presenting a large-scale plant as the only solution to the pollution problem of the conurbation is a political choice and not a technical necessity.

This is not to say that large-scale solutions supported by the state are not a necessity in Cochabamba: the construction of WWTP from the municipalities particularly are a necessity in an increasingly polluted conurbation. However, they can be accompanied by alternatives. The opposition, or the choice not to support, such alternatives should then be considered as a political choice that has not been discussed at the conurbation level, raising questions of democracy in the conurbation water governance.

The construction of the WWTP for the cooperatives San Pedro Magisterio followed quite a tormented path, mainly due to the contrasts between communitarian organizations as well as the municipality over the control of the waterscape. The project was initially designed for a different cooperative acting in District 2. However, it encountered a series of obstacles that forced its move to the cooperative San Pedro Magisterio. NGO workers, and leaders in the cooperatives argued that these difficulties were at least partly due to the hostility of the municipality to the project.

Opposition to the project was then seen as a symptom of the general attitude of the state towards communitarian providers, as well as the focus of the state on large-scale infrastructures. Large scale projects, in fact, reinforce the power of the state on the territory, and are often supported through technical-juridical discourses which posit large-scale projects as the only solution in the conurbation. These discourses were sometimes associated with ones which doubted the technical competency of the cooperatives. This is also compounded by their so-called 'private' nature, which excludes them from the state funding that is necessary to carry out such projects. This small-scale WWTP project was then an attempt to propose a different narrative and to support the role of communitarian organization.

However, while the difficulties encountered by the project could be seen as part of a largest trend, they also had specific characteristics, and were connected to local actors. This emphasizes the importance of local networks of power, of the control that local organizations can exercise over their waterscape and of the need to pay close attention to alliances between municipal politics, local power holders, and territorial organizations. Control over the waterscape is fundamental for the capability of the cooperatives to exercise power. The main point that made this project vulnerable was the fact that that plant needed to be built at the border of the river, outside the area of service of the cooperative for which it had been designed. Furthermore, there were some problems concerning the legal ownership of the land where the plant was supposed to be placed. Finally, the cooperative encountered the opposition to the construction from the OTB in which areas the cooperatives' waste water plant was supposed to be placed. This underlined again how the control of the waterscape in the conurbation is determined by an overlapping set of state rules, regulations, and communitarian control.

Figure 17 The (approximate) area of service of the cooperative for which the plant was designed (red) position project WWTP (yellow), base map: municipality of Sacaba.

The OTB in which area the WWTP was to be built discussed and opposed the construction of the plant during a public meeting. A general fear of waste water treatment plants was first posited as the reason for this resistance, but, as the situation developed, NGO representatives, leaders of the cooperative, and the consultants involved started to argue that the opposition was also due to the involvement and the opposition of the municipality. This opposition was attributed to the fact that the construction of a small-scale plant would have taken away users for their large-scale plant, whose building was scheduled to start soon (see Section 6.1.2).

> There were many elements, one of the main ones was that the cooperative did not have a consolidated piece of land, it did not have a piece of land in reality. The second was a sabotage from EMAPAS on this plant, because it would have taken away 2000 families of users from the municipal system, and then the wife of the president of the cooperative was a member of the opposition in the municipal council (*Oscar Olivera, Fundaciòn Abril, 11.08.2014*)

Trying to grow support for the project, the president of the cooperative organised a meeting with representative of various OTBs of the district, as well as asking to participate in a public meeting of the OTB in which the plant was to be built. Both meetings went quite well. However, the president of the OTB underlined that they could not simply revoke their previous decision, and, in the end, it was decided that a commission would be formed in the OTB to analyse the plant project. While waiting for an answer the cooperative called another meeting to explain the project to the inhabitants of the area surrounding the plant. In this meeting, after an initial hostility, the overwhelming majority of the people present approved the project.

These meetings revealed great awareness of the problems caused by the river pollution, and that people were keen to find a solution. The oratory capability of the president of the cooperative, the fact that he was a long-time prominent figure in the district with deep knowledge of its problems and inhabitants (it was not rare to see him address people by name at various meetings), as well as the technical explanations given in an accessible manner by the designers of the projects, made it so that the inhabitants seemed ready to accept the plant. However, a letter from the municipal provider EMAPAS that criticised the plant on technical grounds put the project into question again.

Adding a further layer of complication to the situation was the fact that the president of the OTB opposing the plant was also the president of the association of OTBs of the district, and therefore a prominent figure in the District 2. General tensions in the district, therefore, were interpreted by my respondents as having an effect in the construction of the plant. Some of my respondents in the district asserted that this organization was quite enmeshed in the municipal politics, as well as rife with internal tensions. The president of the district, for his part, asserted that he was just trying to improve the district, and conflicts in the association of OTBs derived from the fact that to do so, he had broken certain established structures of power in the district; for example, clashing with some cooperatives. He also argued that his OTB was the legitimate authority over the territory and therefore the one that should have a final say over the construction of the plant. He strongly criticized the project and the way in which it was carried out. While it was not possible to clearly understand how all these tensions effectively influenced the construction of the plant, it is important to underline that relationships of power and tensions between different communitarian organizations

emphasize once again how the control over the waterscape is fragmented and not exercised by one single entity.

As a consequence of these complications, it was finally decided that the plant could not possibly be built within a reasonable timeframe in the chosen cooperative and was moved to the cooperative San Pedro Magisterio. The president of the cooperative of San Pedro (which was also the president of the OTB) had in fact previously expressed interest in the project and had a space available within the OTB. These characteristics made carrying out the project simpler. The cooperatives and OTB had, in fact, quite strong links, and the project was to be executed in the territory of the community served by the cooperative. The project in San Pedro, therefore, went on in quite a smooth manner, even if a series of formalities needed to be addressed, and additional funding (obtained through an international funding campaign) were necessary to improve the sewage system.

The control of the community over the waterscape then made the project possible. Furthermore, the population of the neighbourhood supported the plant as the project was conceived as benefiting them directly. One of the cooperative users I interviewed, lauded the project at the same time as she criticized the building of a waste water collector (which would receive waste water from outside the OTB) to canalize waste water to the municipality's WWTP[36]. She underlined how the inhabitants' sense of belonging to their neighbourhood makes it easier for a local initiative to be accepted, when an 'external' one, even supported by the state, might be rejected. The plant is now finished and working.

[36] I could not find further details of such as project, but I report this exchange to exemplify the attitude of the inhabitants on the subject.

Figure 18 Area of Service Cooperative San Pedro Magisterio (red), and position of WWTP (yellow), Base map: Municiipality of Sacaba.

This example allowed me to illuminate and connect many of the themes of my thesis, starting to underline how the themes that emerged from the fourth and fifth chapter contribute to develop urban water governance. Firstly, this case study underlines the significance of the capability of a cooperative or an OTB to control its space, but also how OTBs are connected with wider structures of power. In District 2, in fact, local structures of power influenced the development of project, and the municipality also played a role. The problems that made the construction of the WWTP difficult were partly connected to pre-existing tensions over the control of the waterscape (which, at the very least, fuelled distrust between certain organizations).

Secondly, this case study illustrates the need for the cooperatives to build networks of relationships to obtain funding and support. The cooperative San Pedro, in fact, was able to obtain this project by linking itself with actors at a national and the international level (in

this specific case, the Fundación Abril and the Italian NGO Cevi) and was also capable to receive support from the regional government.

Thirdly, this case study illuminates the existence of differences in vision of the hydro-social territory of different levels of the state. The departmental government stance is a particularly interesting case, as it supported the construction of the Sacaba municipality plant, but also the Cevi project. The regional government had supported the project from the beginning, however, they had no wish to participate directly before a place for the construction of the plant was firmly secured. Nevertheless, when the project received the support of the inhabitants of San Pedro they were ready to offer more substantial support. The project then received support by various department offices (in particular, in the Departmental Unit for Basic Sanitation) while the governor publicly showed his support by participating in a press conference when the plant construction was announced, as well as the ceremony for the opening of the plant. This support might indicate that officials in the departmental government are more open than the Sacaba Municipal Authorities to alternative solutions to Cochabamba water and sanitation problem (even if large-scale projects are still seen as the main solution).

> Sometimes there are mediocrities of the … not of the population, but of EMAPAS itself (…) We have explained to EMAPAS the they [the cooperative] have all the right to build a plant, if they want to treat their water. What the municipality must do is simply supervise that the plant is working (…) through its environmental unit, the one of the municipality. They can control, take water samples, to see if the water is treated or not, right? Therefore, I believe that the cooperative can do it here. Yes, if they have the possibility to build a plant they can do it (…) But I believe, in my opinion, that as a municipality they should not try to stop others from building more plants. This is not good, in my opinion (…) In the end no one is going to force [the cooperative] to discharge in this [EMAPAS's] plant, right? This is their decision. This is what we trying to explain to EMAPAS. That they cannot act as a policeman and say, "you have to connect or else", right? (*Official Unit for Basic Sanitation, Departmental Government, 15.07.2014*)

Fourthly, this case study underlines the difficulties in the relationship between the cooperatives and the municipality, and the efforts of the municipality to expand its control over the territory. Such contrasts are based on competition over the control of the waterscape and are supported through different representation of the hydro-social territory. Part of this vision, is how the municipality sees the cooperatives in the district, often looked as organizations that do not have the technical and organizational expertise to front the growth of the population. These issues were already discussed in Chapter 5, and in Section 6.2, but the assumption over the incompetency of the cooperatives also emerged implicitly from the way in which the municipality criticised the technology proposed in the design of the original plant and expressed worries on the capability of the cooperatives in general to appropriately manage a WWTP.

While, in fact, EMAPAS interviewees frequently underlined that they did not wish to take away the networks of the cooperatives, and that the cooperatives were free to implement their WWTP, they, however, expressed some worry over the capability of the cooperatives to carry out and take care of such a project. Specifically, on the original WWTP project, they expressed reservation about the technology employed. There were some other observations, mainly concerning the need of additional documentation, information, and formalities, but those, argued the designer of the project, were solvable (and in fact they were obtained before starting the construction of the WWTP in San Pedro). The bigger obstacle was the overall criticism of the technology that the cooperative wished to employ.

> We received the project of the treatment plant so that we could revise it. As technicians we gave our opinion (…) It had a lot of problems, to say the truth, the project. It seemed simply an Imhoff tank and it did not have any more treatment. I would suggest that they revise the technology that they think to apply, and also to revise the population and the flow, because there were voids in the project (*engineers, EMAPAS. 08.05.2014*)

The designer of the project answered the criticism of the technology employed by underlining that the technical personnel of EMAPAS did not have experience with the technology proposed (Upflow Anaerobic Sludge Blanked), that had been selected as the most appropriate for the space and budget available. He argued that the problem was that the municipality engineers are used to think only about large-scale plants, but that the

technology that they proposed has been largely employed in South America. In a sense, these interviews flipped over the discourse of the municipality, criticizing EMAPAS' competence. Furthermore, this exchange of criticisms underlines how technical discourses often conceal political reasoning.

> But fundamentally they commented that these kinds of plants are not useful, because they did not give results. So, I repeat again, how can they speak about something that they do not know, how can they criticize something of which they have no experience (...). But, behind everything, there are the issues of which we spoke before: that there is an interest to criticise the technology (*interview, designers project Cevi, 11.04.2014*)

Finally, this case offers an example of how alternative visions of the hydro-social landscape can be constructed. The capability of the cooperatives, and of the water movements allied with them, to develop discourses that are discordant with that of the municipality is a sign of their capability to resist state power. This shows that the state does not have complete control either over the waterscapes, or over hydro-social imaginaries. The capability of those involved in the project to criticise EMAPAS competency, then, could be read as a capability to resist the discourse of the municipality that posits its role as the sole actor for the resolution of the Sacaba wastewater issues. These criticisms furthermore, contribute to modify a discourse that posit communitarian providers as simple artisanal system, incapable of coping with the progress of the conurbation, and therefore as 'stepping stones' useful only before the arrival of a municipal system.

Furthermore, the construction of small-scale plants also implicitly criticizes the discourse which posits large-scale infrastructural work as the sole possible solution of the waste water pollution crisis in the conurbation. Both in the municipality and in the departmental government office, large scale plants have always been seen as the main solution. While the departmental government did support the plant of San Pedro, it did not seem that this was part of a political vision that included small-scale plants (in urban areas) as the solution for sanitation problems. Social problems, and the problem of obtaining land were in fact mentioned by most state interviewees, but the possibility for smaller plants to be part of a solution seemed to not have been seriously considered. Small-scale plants administered by

communities have been built in the Cochabamba department, but usually in rural areas. One plant has been built in an isolated neighbourhood in Cochabamba and it was considered to be a solution at the level of neighbourhood, where the municipal system had not arrived.

It is important to underline that these discourses do not necessarily criticize large scale solutions or downgrade the importance of the state in finding a solution to this problem. However, the presence of small scale waste water plants could be considered as an advantage instead of a difficulty. While EMAPAS projects are indubitably a necessity, and the municipality of Sacaba had been admirably active in improving its water and sewage services, these improvements do not necessary exclude complementary projects and organizations. The Fundacción Abril NGO (which assisted on the construction of the waste water treatment plant of San Pedro) members in particular considered the communitarian character of the San Pedro plant as an advantage, as it guarantees more transparency, and the possibility for the plant to be followed more closely by the whole community.

Some respondents working in the project also mentioned that large-scale structures could not solve the problem on their own, and it would be interesting to have a mixture of small and large-scale plants. The social difficulty of building a plant, the expense of using large stretches of land, as well as the continuous growth of the conurbation were mentioned. This solution was also mentioned by an ex-official of the departmental government environmental office. She relayed that she had wanted to push for small treatment plants, but she did not get the political support for it. She argued that the best solution would be the combination of small and large plants, as due to the growth of the population building only big ones is not sustainable. Interest in building small-scale treatment plants and the difficulties in building large infrastructures due to the changing structure of the conurbation was also underlined by a SEMAPA officials. However, these opinions seem to still be a minority.

> Mixed, big and small, right? Because water cooperatives are already established, right? So, we have to understand the reason why these associations exist. We are growing chaotically, so that we must find long-term solutions. And, for me, long terms solutions are these mixed associations. Not saying “the small ones are useless,” right? They need to be done, because the big ones are not going to be enough, and in

> 20 years they are going to be another Alba Rancho (*ex-officer Departmental Environmental Unit, 03.07.2014*)

Conclusion

This chapter underlines how water governance, in Cochabamba, is a complicated and contradictory affair, influenced by different actors, acting at different scales. Governance is built and changed through the material construction of the waterscape as well as through discourses and the way in which the two influence each other. Governance is a deeply political discourse, but it is often posed in technical and legal terms. Acknowledging the underlying discussion over the role of the communitarian providers is then necessary to create a more democratic water governance.

To understand the influence of communitarian providers in the creation of the conurbation governance, it is necessary to look both the way in which they build their physical waterscape and the way in which they imagine it, to say their imagined hydro-social territories, both built though the lived history and the day-to-day interaction of the cooperatives' users. This chapter underlined how these interactions created discourses that aim to defend the cooperatives' autonomy, while long-term interaction with the state created a certain level of distrust towards the municipal authorities. Therefore, as the municipal control over the territory increased clashes both at the discursive and at the material level emerged.

The construction of large-scale infrastructures by the state, in particular, are supported by a desire to control and order the waterscape, as well as the vision for a universal service provider, either at the municipal or at the conurbation level. The capability of the cooperatives to resist this vision takes different forms: through the construction of formal networks capable to shift the discourse and open the use of state resources to the cooperatives, through the construction of alternative solutions which challenge the dominant discourse on large-scale infrastructures; and through resistance brought by their shared hydro-social territory and their sense of ownership over their territory. The governance model of the municipalities and of the state then, often need to be re-ordered around the

cooperatives. However, the cooperatives do not only passively resist the state but have been creating networks capable of modifying the dominant state discourse.

Conclusion

Introduction

As attention towards communitarian providers in cities has increased, the literature has posed questions regarding their ability to exercise agency. The answers to such questions have significant consequences for analytical approaches to democratic governance in cities as well as how urban communities can exercise their right to the city. This dissertation focuses on the capability of communitarian organization to influence urban water governance.

My research contributes to this body of literature by presenting a framework of analysis that underlines the importance of connecting the ways in which urban communitarian providers physically and discursively control space, to the influence of that control over relationships of power at different scales. More specifically, I emphasise the need to consider material and discursive control of limited spaces in relation to wider governance. The framework of analysis that I propose and apply in this thesis links different scales and spaces of analysis by connecting the concepts of scale, waterscape, hydro-social territory and networks through an enhanced version of the TPSN framework of Jessop et al. (2008).

The first section of this chapter briefly summarises my research aim. It then illustrates how I reached such aim through an analysis of the Cochabamba water cooperatives. The second section describes my analytical and empirical contributions to knowledge. Finally, the third section explores limitations of this study as well as avenues for future research.

Research aim and main insights

This section briefly reviews the main objective of this dissertation and the corresponding research questions. It then explores the main findings and their contributions to accomplishing the research aim.

The overall aim of this dissertation is to determine how communitarian providers influence patterns of urban governance on the basis of the case of water cooperatives that operate in the Cochabamba conurbation. The case of Cochabamba is useful for my analysis for two main reasons. First, the heterogeneous waterscape of the Cochabamba conurbation allowed me to study the interactions of various state authorities and communitarian organisations that influence water governance at different scales. Second, the strengthening of state intervention revealed tensions concerning control of the waterscape. Both of these elements offered insight into the impact of actors who operate in diverse spaces and at a variety of scales.

Rather than conceptualising governance as a coherent set of actors and institutions, my analysis assumes a definition of governance as a process that is created by divergent and occasionally clashing interests. Governance is an inherently political process through which multiple visions of the waterscape interact. Therefore, to analyse urban water governance, it is necessary to examine how communitarian and state actors at various scales use formal and informal processes and institutions to influence the control, channelling and distribution of water.

To understand water governance in the Cochabamba conurbation, I first explored how both the state and the cooperatives have affirmed and strengthened their respective roles. I then analysed the ways in which they have influenced, limited and conflicted with each other directly or through networks. On the basis of these three elements, I investigated the production of governance through numerous actors and visions in a variety of scales and places.

I achieve my research aim by answering the following questions:

- *How do cooperatives protect and further their role as a water provider?*
- *How do state institutions affirm their role in the water sector?*
- *How do the state and the cooperatives interact in the water sector?*

The answers to these research questions illuminate the relationship between the state and the cooperatives at multiple scales and reveal how these relationships shape water governance.

The overall conclusion of this dissertation is that cooperatives can influence water governance on a variety of scales and in multiple ways through the control of their waterscape and capability of elaborating imagined hydro-social territories. Such territories are propagated in scale through networks. Moreover, the ability of the cooperatives to control the waterscape and create hydro-social territories derives from their history and relationship with their members, which cultivates feelings of belonging to the territory. Furthermore, I argue that the ability of both the state and the cooperatives to control their waterscape and hydro-social territory are correlated and mutually influential. Specifically, the hydro-social territory affects the protection of the waterscape, and the modification of the waterscape impacts the hydro-social territory. Therefore, material and discursive controls over the waterscape co-produce and influence each other.

In this section, I first underline the importance of the ability of cooperatives to materially and discursively control their waterscape. I propose that the capability of creating a shared hydro-social territory is the method by which the cooperative can exercise discursive power. Such shared vision is cultivated through the history of the cooperatives and, specifically, the sacrifices of inhabitants to create the waterscape. The establishment of a shared hydro-social territory is fundamental to the relationship between the cooperatives and their members, which is essential for their ability to physically control and maintain the waterscape. Examining how the cooperatives establish discursive and physical control over their waterscape clarified their ability to influence water governance at the conurbation scale.

The physical presence of the cooperatives and their means of impacting the waterscape limit the ability of the state to control and order the territory. Additionally, a shared hydro-social territory is vital for the ability of the cooperatives to present alternatives to the strong 'imagined' hydro-social territory of the state and, in particular, of the municipalities. In fact, cooperatives question the discourse that represents them as a 'stepping stone,' inefficient organisations or even 'private' organisations that are 'searching for profits.' To combat this discourse, they have proposed another narrative which presents them as organisations that serve a community, are more present on the territory compared to the municipal company and, therefore, are more capable of following the wishes of their inhabitants. Through these discourses, cooperatives have carved their own space in the conurbation and challenge the dominant discourse of municipal authorities. Finally, the formation of networks propagates and reinforces such discursive and material control. These networks reinforce the vision of the cooperatives as legitimate providers and create links between them and the state at multiple scales. The interaction at these scales is particularly relevant, given that the state perspective varies by level.

Despite the ability of the cooperatives to influence water governance, they are not the primary actor with this capability. The state can exert control that is strong, though not unchallenged, over the waterscape of the conurbation through institutional, legislative and material changes. In the case of Cochabamba, I interpret the attempts of the state to 'order' the waterscape through state legislation and large-scale infrastructure as an effort to make the waterscape more legible and, therefore, more controllable. I argue that such intervention depends on their vision of the hydro-social territory – and specifically those parts under the control of communitarian providers – as disordered and, thus, difficult to understand and control.

Attempts to make the waterscape more ordered and controllable are associated, especially at the municipal scale, with a vision of an 'ideal' hydro-social territory, wherein the state provides the service through a universal service provider at either the municipal or conurbation level. While this ideal configuration is difficult to achieve, it can influence the action and projects of the state. Therefore, it can have real effects on their view and modification of the waterscape as well as their vision of the role of communitarian providers.

While most state officials have viewed peri-urban communitarian organisations as weak and at risk of disappearing, the state's vision of cooperatives does change with the level of the state. Municipal officials often use delegitimising discourse in regard to the cooperatives, such as by defining them as 'private' and asserting their own role as 'legitimate service providers.' Such discourses are often used to justify excluding the cooperatives from state funding. Other levels of the state are more likely to accept communitarian organisations as legitimate providers. Cooperatives therefore attempt to create connections with various levels of state through a network to receive support and resources.

From this perspective, cooperatives are not independent but in fact subject to changes about which they have limited input. State-induced changes in water governance strongly influence the cooperatives. In the conurbation, legislation such as rural reforms – and, more recently, the formalisation of communitarian water providers – has and continues to influence cooperatives. Alterations to the material waterscape through large-scale infrastructure have the potential to weaken communitarian organisations, but they might also present an answer to the need of certain cooperatives to access quality water sources and to purify waste water. Furthermore, cooperatives reside within a wider waterscape whose evolution, which resulted from migration, population growth and large-scale infrastructure construction, heavily impacts cooperatives.

Considering the influence of the state and cooperatives over both water governance and each other, it is apparent that the state exerts a stronger impact on the shape of the waterscape and it is therefore capable of designing and imposing a more dominant vision of the hydro-social territory. However, this control is not unchallenged. Communitarian organisations and providers with whom the state must negotiate are vital for the ability of the state to physically modify different spaces. Furthermore, the state's vision of the future of water governance in Cochabamba is contested by communitarian providers, whose presence offers an alternative model of governance. Thus, cooperatives are able to negotiate with the state at various levels and occasionally use the state's internal contradictions to resist its attempts to strengthen direct control over the territory and reinforce the state's presence and rights over the territory. Through both their independent efforts and their networks, cooperatives can exercise a certain amount of agency. A crucial conclusion of this thesis is that all means by which cooperatives and the state influence each other must be considered in combination in order

to understand the participation of these various actors in the development of water governance.

Contribution to knowledge: the 'enhanced' TPSN framework, the role of urban communitarian providers and democratic water governance

This section details the contribution of this thesis to the knowledge of the field. I argue that this thesis contributes to knowledge in three main ways. Firstly, I broadly contribute to the literature on multi-stakeholder water governance in urban areas by exploring how communitarian organizations influence water governance. This is a facet of urban governance that has been little explored in the literature. I argue that communitarian organizations' capability to exercise discursive and material power at the local level is the basis for their capability to influence wider urban water governance. This brings me to my second contribution to knowledge: the modified TPSN framework. This framework allows me to look at how power, exercised in different ways, at different scales, in different spaces, and through networks, influences water governance in an urban space. Through this framework, furthermore, I make my third contribution, specifically to the literature on democratic water governance. I argue that the capability of local communitarian water providers to exercise their right to the city (seen here as the right to decide how the city should be shaped in relations to water provision) in limited spaces contributes to the democratization of water governance at a higher scale. Communitarian organizations can, in fact, limit the power of the state both by materially controlling their local waterscape and through their capability to create discourses on how the overall urban waterscape should be shaped. The existence of alternative discourses contributes, in an admittedly limited way, to democratize governance in the city, especially by contesting the supposedly neutral decisions taken by the state apparatus. Adding to these three main contributions, this dissertation also contributes to empirical knowledge of communitarian sewage and wastewater management in cities. The rest of this sub-section expands on these contributions.

How communitarian organizations contribute to water governance is a facet of multi-stakeholder urban water governance that has been little addressed by the literature, but which

has important implications. The capability of communitarian providers to exercise agency is a point of debate in the literature, but the discussion often only focuses on the capability of communitarian organization to resist state control. My dissertation offers a contribution to this literature as it does not only consider the capability of local organizations to resist state control but also looks at how such organizations influence the overall shape of urban water governance. Exploring the capability of communitarian organizations to exercise power to influence governance, I argued that such capability is based on their control over their local waterscape. Such control, I contend, allows communitarian organizations to interact with and limit the power of the state at different scales, therefore influencing urban water governance as a whole.

Debates over the role of small-scale providers emerged due to a shift in policies concerning water provision in the Global South. After privatisation policies failed to deliver water to the 'poor' interest in communitarian providers rose among both proponents and opponents of privatisation (Bakker, 2008, p.236). This heightened interest was accompanied by a shift towards multi-stakeholder governance models, which include attention to 'civil society' participation. From this context, a debate over the role of communitarian providers emerged, especially over the capability of communitarian organizations to exercise agency. Parties have expressed fear that the state or elites would co-opt communitarian organisations or that 'community participation' could be used to justify abandoning or underserving part of the population (Finewood and Holifield, 2015, p. 89) (Bakker, 2013a, p. 257). The capability of communitarian organizations to resist the control of the state is therefore put into doubt. Authors argue that the participation of civil society to service provision can be interpreted as governmentality, to say as a technique of governance aimed at disciplining the population (Swyngedouw, 2005b, p. 2003). Such a concept is often applied in the literature when looking at the capability of the state to control urban and environmental governance. However, such a vision is also contested: Kooy and Bakker (2008), for example, argue that 'governmentality' is not a totalizing system, especially in a post-colonial context. Appadurai (2001, p. 35) offers examples of urban communities' networks capability to exercise 'governmentality from below'.

Perreault (2008, p. 839) has therefore argued that more attention should be directed to 'social movements, resource users' groups, or other civil society organizations' in natural resource governance. Studies have investigated the ability of rural organisations to influence water

governance (Boelens et al., 2015; Bridge and Perreault, 2009, p. 487; Hoogesteger, 2012) as well as the interaction between 'informal' providers and the 'formal' state providers (e.g. Ahlers et al., 2014; Bakker, 2008; Cheng, 2014; Marston, 2014; McMillan et al., 2014; Schwartz et al., 2015). However, research has only marginally examined the ability of 'informal' providers to influence governance at a higher scale and in an urban context. The few exceptions especially concern the case of the Technical Water Committees in Caracas and their relationship with the public utility. Studies on this subject have argued that communitarian organisations were able to exercise a form of social control over the water utility and, therefore, to engender change in water governance (Allen et al., 2006, p. 348; McMillan et al., 2014, p. 203).

However, the last two studies do not focus on the material and social relationship between urban communitarian organisations and their physical waterscape. My thesis underlines that this relationship is fundamental for their capability of influencing water governance. Through a detailed, empirical exploration of communitarian water providers in Cochabamba, I demonstrate that an analysis of water governance should take into consideration the relationship between communitarian providers, their physical waterscape and their vision of it (i.e. their hydro-social territory). Previous research has assessed the importance of a community's conception of its territory to influence large-scale water governance but is limited to a rural context. Romano (2016) has asserted that Nicaraguan rural water providers use networks to propagate their 'hydro-social' territories in front of the state in order to protect their autonomy and enhance democratic governance (see also Hoogesteger et al., 2006). Nevertheless, no research has examined the relationship between communitarian water providers and their territory, and the effect of this relationship on water governance in an urban waterscape at multiple scale.

Authors have underlined the importance of seeking resistance at multiple scales (Perreault, 2008) and encouraged attention to 'the power of self-governance' as well as the 'micro-politics of subject formations' (Gabriel, 2014, pp. 41–42). I address both these calls by stressing the significance of small-scale territorial control and shared history in determining the ability of grassroot actors to resist state power at both a local and at a higher scale. Additionally, I highlight the criticality of the geographical limits of territorial control that the state can exercise within cities. Authors have argued that the state's capability of controlling processes of informality (Ahlers et al., 2014, pp. 4–5) and exercising

'governmentality' (Gabriel, 2014; Kooy and Bakker, 2008) is limited. However, I propose that this limitation should also be viewed in relation to the ability of the state to exercise territorial control, as the control that the communitarian organizations exercise on their local waterscape limits the material control of the state. Therefore, I argue that a true understanding of the formation of water governance in the Global South requires examination of the contributions of communitarian providers at multiple scales and in different ways.

This conclusion lead to my second contribution to knowledge: the enhanced TPSN framework. In my dissertation, I argue that to analyse the ability of communitarian providers to influence urban water governance, one needs to take into consideration the existence of physically overlapping waterscapes and hydro-social territories that are produced and controlled by both communitarian organisations and the state at different scales. The capability of communitarian organizations to exercise power should be then considered at different scales, both as single organisations and through the use of networks.

To examine how all these facets of water governance overlap, I elaborated an 'enhanced' TPSN framework that supports a detailed analysis of the role of communitarian providers in an urban context. It allows for connecting analyses of waterscapes and hydro-social territories that were carried out in separate spaces and geographical scales to understand how they influence the overall urban water governance. It also facilitates an analysis of the interaction between actors at different scales while grounding them in their relationship with their waterscape. Furthermore, it clarifies how the discourse regarding the waterscape informs material control over it. Finally, it permits an examination of the effect of networks at different scales on governance. This framework, thus, contributes to the literature on urban water governance by encouraging the integration of separate concepts, such as scale, hydro-social territory and waterscape, as well as through its suitability for multi-scale and multi-site analysis.

The analysis that followed this framework also allowed me to make a contribution to the literature on democratic water governance. I argue that waterscape modification and participation in water governance by communitarian providers are means by which urban communities can exercise their right to the city. Chapter 1 has asserted that democratic water

governance should include the right to modify and participate in governance arrangements and in the evolving shape of the city on both material and discursive levels. The concept of democratic water governance can then be reconfigured as the right of inhabitants to exercise their right to the city (Perreault, 2014, p. 243). In Cochabamba, cooperative members effectively participate in the production of their waterscape and its associated imaginaries (i.e. hydro-social territories). In this way, they are exercising their right to the city on a small scale. However, the state has also produced a discourse concerning the role of cooperatives and its own role that often presents contradictory effects. These visions are decisive in configuring the conurbation water governance, though often without an open political debate. For cooperative members and Cochabamba inhabitants in general to fully exercise their right to the city, an open debate on the optimal approach to water governance is crucial. Therefore, I argue for the need to observe how the right to the city is exercised at different scales as well as how discourses regarding the ideal hydro-social territory are produced and contested and which facets of it are open to discussion.

Finally, this thesis contributes empirically to knowledge of communitarian organisations in cities and to the area of community-managed waste water treatment in particular. The literature has rarely considered this aspect of communitarian management (for literature on communitarian sewage treatment, see Das, 2015). The state has advocated for large-scale solutions, and only a few state interviewees believed that waste water treatment on a smaller scale could be useful. However, because of the difficulty of procuring large tracts of land as well as the social opposition to the construction of large-scale treatment plants, communitarian management could support improvements to waste water pollution in the conurbation. My dissertation suggests that the population might be more receptive to a plant that treats the community's own waste water and is controlled by an organisation with which they have a close relationship. While the one case I observed does not yield enough data in this sense, it does imply that alternative solutions are feasible for waste water treatment in cities in the Global South.

Limitations and recommendations for future research

Time and access restraints imposed limitations on my fieldwork. This section explores such limitations and subsequently recommends areas for future research. Certain decisions that I

have made during my fieldwork yielded beneficial results and excluded avenues for inquiry. However, an in-depth study of cooperatives in different municipalities may clarify discrepancies between the water policies of municipalities. Conducting research in a municipality without a municipal water provider could have more clearly underlined how water governance at the local level is influenced by the presence of a municipal provider. More generally, it may reveal how a stronger or weaker ability of the municipality to provide the service influences the ability of communitarian organisations to shape water governance. Furthermore, water governance involves other actors, such as private organisations, irrigators (considered only marginally here) and mountain communities. Although these inquiries were beyond the scope of this dissertation, a study that encompasses these organisations could provide a more precise understanding of the creation of water governance in the conurbation.

My fieldwork has also imposed a limited time period to explore operations. When I finished my fieldwork, certain projects were on the brink of beginning or finishing, including the Misicuni project, the WWTP (waste water treatment plant) of Sacaba and the WWTP of the cooperatives of San Pedro Magisterio. A study of the effective consequences of these projects is a fundamental area of inquiry for a future research. In fact, the construction of such infrastructure will heavily impact the physical waterscape. More specifically, large-scale infrastructure might strengthen the control of the state over the waterscape and over water governance in general. A study on the functioning of the WWTP of San Pedro Magisterio might yield a useful analysis of small solutions for large-scale issues in an urban context.

My research has focused on why and how communitarian providers influence water governance. Through interviews with state officials, I explored the state's motivation and ability to shape water governance in a certain way. However, a more in-depth study of decision making and discourse cultivation within state institutions is necessary to clarify the motivations of various state levels as well as how they develop and apply their vision of water governance. Ethnographic studies within state institutions are inherently difficult but could indubitably provide an interesting context to investigate differences in discourses at various state levels as well as the elements that inform political decisions. It could also be useful to obtain a deeper explanation of party politics and the influence of certain elements,

such as elections or differences between the parties in power at each state level, over water governance.

A final line of inquiry for future research could be a case study of Santa Cruz cooperatives and their creation of a constructive relationship with the state. Such research might introduce a comparative element to my study of Cochabamba water cooperatives and reveal how power impacts the ability of cooperatives to influence water governance.

Conclusion

This dissertation has connected the ways in which communitarian providers and the state have clashed, co-operated and influenced each other to create water governance at different scales. It has underlined how urban organisations can develop a shared vision of their waterscape, which informs their decision-making and capability of influencing water governance. I have argued that such organisations can contest state discourses and control by exerting their ability to defend their material waterscape and propagate their hydro-social territories through networks and examples of alternative governance.

This analysis was guided by the 'enhanced' TPSN framework, which integrates the concepts of waterscape, hydro-social territory, scale and network. Thereby, the framework offers insight into the creation of water governance through visions and material control that interact at various scales and are connected through networks.

Finally, this dissertation has demonstrated the value of considering how actors exercise democratic control of resources in different spaces in the city on the basis of shared experiences and history. Thus, it has revealed that such control can have democratising effects on governance at a larger scale.

Glossary

- **AAPS**: *Autoridad de Fiscalización Y Control Social de Medio Ambiente y Agua* – Authority for the Regulation and Social Control of Water and the Environment.
- **Aguatuya:** Cochabamba-based NGO that works in the water sector.
- **ASICASUDD-EPSA*:*** *Asociación de Sistemas Comunitarios de Agua de Sud Departamental y Entidades Prestadoras de Servicio de Agua y Saneamiento de Cochabamba.* Departmental association of communitarian water providers of the South and of water and sewage providers of Cochabamba.
- **BID:** *Banco Interamericano de Desarrollo*- Inter-American Development Bank.
- **CAF:** *Corporacion Andina de Fomento*: Andean Development Corporation.
- **CLOCSAS**: *Confederación Latinoamericana de Organizaciones Comunitarias de Servicios de Agua y Saneamiento* – Latin-American Confederation of communitarian water and sanitation providers.
- **Directors:** *dirigentes* - elected officials of a cooperative, federation, OTB.
- **EMAGUA**: *Entidad Ejecutora de Medio Ambiente y Agua* – Executing Agency for Water and the Environment.
- **EMAPAS**: Sacaba Municipal Water Provider.
- **EMAPAQ:** Quillacollo Municipal Water Provider.
- **FECOAPAC:** *Federación de Cooperativas de Agua y Alcantarillado de Cochabamba* - Departmental Federation of Water and Sanitation Cooperatives of Cochabamba.
- **FENCOPAAS:** *Federación Nacional de Cooperativas de Agua y Saneamiento* - National Federation of Water and Sanitation Cooperatives.
- **FEDECAAS:** *Federación departamental de agua potable y alcantarillado de Santa Cruz* - Departmental Federation of Cooperatives of Water and Sanitation of Santa Cruz.
- **FPS**: *Fondo de Inversión Productiva y Social* – Fund for Productive and Social Investment.
- **Fundación Abril**: Cochabamba-based NGOs active in the water sector and chaired by Oscar Olivera, one of the leaders of Cochabamba's Water War of 2000.
- **OTB**: *Organizaciones Territoriales de Base* – Grassroot Territorial Organizations, legally recognized neighbourhood associations.
- **PMMC**: *Plan Maestro Metropolitano Cochabamba* - Metropolitan Masterplan of Cochabamba.
- **SEMAPA:** Cochabamba municipal water provider.
- **SENASBA:** *Servicio Nacional para la Sostenibilidad de Servicios en Saneamiento Básico* **–** National Service for the Sustainability of Basic Sanitation Services.
- **Member of a cooperatives**: Share-holder of a cooperative.
- **UMSS**: Universidad Mayor de San Simón, Cochabamba public university.
- **WWTP**: Waste water treatment plant.

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Appendix

Appendix 1: FECOAPAC questionnaire

GENERAL INFORMATION	
Name interviewee	.
Foundation year	
Territory	**Municipality:**
	OTB:
	Locality:
	Borders:
Juridical personhood	**Administrative decision n.:** **Date:**
Register (cooperative)	**N.**
Licence AAPS	

INFRASTRUCTURE	
Water Sources	
Water sources	**Kind of water sources:** **n.**
Do you have water regularly?	
Location of water sources	
Property of water sources	**Shared**: yes/no
Quantity of water	

Pumps	
Water tank	
Size	
How many	
Network	
Water	Yes/no
Sewage	Yes/no
Condition of the network	
Water Quality	
Depuration	
Analysis	**Date of most recent:** **Results:** **How many times per year**:
Waste Water	
Waste Water treatment plant	**Yes/no:** **What kind**:

Where do you discharge the waste water?	

Water distribution	
How many hours do you have water?	
Water per member (household)	
Is it sufficient?	Yes/no

Cooperative's members	
Number of members	
Number of users	
Members that are not persons	**Public institutions:** **Industries:**
Water Prices	
Social	
Domestic	
Industrial/Commercial	

Employees	
Number	
Roles	

Projects	
Did you/do you have any project?	
Timeframe	
Collaborations for the project	

Appendix 2: Interview guide for the representative of a cooperative

The questions underlined in bold were asked directly and the others were asked in case the person did not incorporate the desired information in their answers. This interview took place after the FECOAPAC questionnaire.

PERSONAL INFORMATION

- **What is your name? What is your role in the cooperative?**
- **Since when have you been involved in the cooperative? Why did you decide to get involved in the cooperative?**

HISTORY

- **Could you tell me about the history of the neighbourhoods/OTBs where the cooperative operates?**
  - When was the neighbourhood founded? What is its composition (are there immigrants, and in this case, from where)?
- **What is the history of the cooperative?**
  - When was the cooperative created?
  - Why was the cooperative created?
  - Was there another entity (such as an informal committee) before the cooperative was legally established?
  - How was the infrastructure built? Did people contribute with communitarian works? In which other ways the community contributed to the construction?
- **Why did you decide to establish a cooperative and not, for example, a water committee?**
  - How did you legally establish the cooperative? Was it difficult? Did you have

any help with it?

MANAGEMENT

- **Could you tell me about the water and sewage management in your cooperative in general?**
  - Did you have any conflicts for the water sources? Did you share it with anyone? How did you obtain them? Who is the owner of the water sources?
  - Who are the owners of the cooperative? Who are the owners of the infrastructure?
  - Is the cooperative the only entity that provides water and sewage in this territory? (if not, who else? The municipality? Other cooperatives?)
  - Could you tell me about the water quality? How could it be improved if needed?

ECONOMY

- **Do you think water prices are appropriate? How did you establish them? Did you have any problem with it?**
  - What are the main expenses of the cooperative?
  - Is the cooperative able to cover all the expenses? Do you have money for projects?

ENVIRONMENT

- **Do you have any environmental problems (for example, contamination of the river or the water sources)?**

COOPERATIVES MEMBERS

- **Do you give water to all the families that live in your territory?**
- **Are all users also members of the cooperative?**
- **How does someone become a member of the cooperative?**
  - Who can be a member? What is the advantage in being a member?
- **How do users consume water?**
  - Are users careful in the usage of water? Are there any fines to encourage a careful usage of water?

DECISION-MAKING

- **Can you tell me about the decision-making process of the cooperative?**
- **Can you tell me about how the members participate in the cooperative?**
  - Could you tell me about the general assembly? Do members participate in the general assembly? What kind of decisions the general assembly take?
  - Are you satisfied with the level of participation of the members?
  - In what other way do the members participate in the cooperative? Do you carry out communitarian works?
  - Are there fines for not participating?
  - How do you communicate the annual financial review to the members?
  - What kind of decisions do the boards of directors take?

RELATIONSHIP WITH THE STATE

- **What kind of relationship do you have with state organizations (national agencies, departmental authorities, municipality)?**
  - Do you have any relationship with the water ministry and its agencies (AAPS, EMAGUA, SENASBA)?
  - What kind of relationship do you have with the municipal provider/ the municipality basic sanitation unit?
- **Do you think that the authorities do enough for the cooperative? Why?**
  - What kind of role should state authorities have in your opinion?

FECOAPAC

- **When did the cooperative become a member of FECOAPAC?**
- **Why are you part of FECOAPAC?**
- **In what way do you participate in FECOAPAC?**

NGO/INTERNATIONAL AND NATIONAL MEETINGS

- **Do you have any relationship with NGOs or foreign cooperation agencies?**
- **Did you ever participate in workshops, meetings, debates on water?**
    - If yes, could you tell me about this?

Appendix 3: Additional questions for the interview of cooperative representatives

Supplementary questions for interviews and re-interviews with heads of cooperatives carried out from May onward.

ECONOMY

- **Could you tell me how much the members pay to connect to the cooperative's network?** How did you decide this price?
- **How do you use this money**?
- **Did you have many new members this year?** Is the number of new members going down?
- **What is the main source of income of the cooperative?**
- **Do you have savings for large projects (for example, to renovate the network)?**

SEWAGE

- **Does the municipality manage the sewage?**
    - If yes: why?
    - If not:
        - How did you build the sewage network?
        - In what condition is the network? Is it difficult to look after it?
        - Do you have a waste water treatment plant? How does it work?

MEMBERS

- **Are all the members acknowledged by the state?** Did you have a problem with the official acknowledgement? Did FECOAPAC help you with this?
- **How long does it take for the cooperative to make a new connection?** Do you have problems to connect new members?
- **Are there people/industries in your service areas that have their own well?**

RELATIONSHIP WITH THE STATE

- **What is your relationship with the municipality?**
- **Do you think that the state is under the obligation to help the cooperative?** In which ways?
- **If the state finances a project in your territory, who is going to own the infrastructure?** What do you think of this?
- **What do you think of the future of the cooperative?** Is it going to be controlled by the state? Why?

EMPLOYEES

- **You/the president of the cooperative: what role do/does you/he have in the cooperative? What is the role of the employees?**

ENVIRONMENT

- **Do you have an environmental licence?**

AAPS

- **Do you have the AAPS licence? Why?**

Appendix 4: Interview guide for water users of the cooperatives San Pedro Magisterio and Quintanilla

PERSONAL INFORMATION

- **Could you tell me your name, age and occupation?**
- **Is a member of your family a member of the cooperative?**
    - **If no:** What kind of agreement do you have with the owner of the house (e.g. are you a renter, a relative...)? Does the owner live in the neighbourhood? Is the owner a member of the cooperative?
- **Can you tell me how many people there are in your house?**
    - Family composition
    - Profession
    - Level of education
- **Where does your family come from?**
- **Can you tell me when and why you came to live in this neighbourhood?**
    - How did you obtain the land/house?
- **Could you tell me what water system did you had in the place you lived before coming here?**
    - What kind of water/sewage connection/system?
    - How was it administered (e.g. municipal system)?
- **Do other families live with you? What relationship do have with them (e.g. renters, relatives)**
    - Can you describe me this family (number of people, professions, how long did they live there)?

OFFICIAL MEMBER

- Who, in your family is the official member of the cooperative? Why?

- Can you describe to me how and why your family became a member of the cooperative?
- Can you tell me about the history of the cooperative (if they are long-time users)?
- Has the cooperative changed (since it started/ in last years) in your opinion? In what way? How did the service change?

COOPERATIVES SERVICES

- **Do you obtain both the water and the sewage service from the cooperative?** Do you also have the service from other sources? Why?
- **How do you utilize the water?**

OPINION ON THE COOPERATIVE

- **What do you think of the service of the cooperative?**
  - What do you think of the water service (water quality, continuity of the service, meters, breakage, service interruption)?
  - What do you think of the sewage service (blockages, breakages)?
- **What do you think are the main problems? And what do you think are the strong points?**
- **Do you think that the water and sewage service has improved in the last 5 years? Why and how?**
- **What do you think of the management of the cooperative?**
  - What do you think of the work of the directors and of the employees?
- **Is there are a social control over the directors? In what ways is this carried out?**
- **Do you think that the management of the cooperative has improved in the last 5 years? Why and how?**

PRICES/FINES

- **What do you think of the prices of the cooperative?**
  - What do you think of the water and sewage prices?
  - What do you think of the connection fee?
  - What do you think of the fines for non-participation?
  - What do you think of the late fines?
  - Were there extra payments for projects?
- **Do you that the price could raise of the cooperatives needs it?** What would you think of this?
- **Is the cost of the service a problem for your family's economy?**

- **Do you have a problem at times to pay the cooperative? Could you give me an example?**
- **What do you think of water cuts?**

PARTICIPATION

- **Can you describe how do you participate in the activities of the cooperatives?**
  - For example, in what activities have you taken part in the last year?
  - What do you think of these activities?
- **In your family who does participate in these activities?**
  - What do you think of this? In what ways those of your family that are not members participate in the cooperative?
- **If you have renters/if you are a renter how do they/you participate in the cooperative? What do you think of this?**
- **Do you think that the participation of the members is important?** In what way would you like to participate?
- **Do you feel that your opinion is taken into consideration?**
  - Is the opinion of the users taken into consideration? Why?
- **Does the cooperative give you enough information on its activities?**
  - Would you like more information?
- **Do you know where the water of the cooperative come from?**
- **Do you know if the cooperative is carrying out any project?**
- **Do you know what happens to the waste water? What do you think of this?**
- **What do you think of the river Rocha pollution? In your opinion how is this problem going to be solved?**
- **(Only in San Pedro Magisterio) Have you been informed over the project of the waste water treatment plant? What do you think of it?**
- **(For long-time users) Do you think that the way in which people participate in the cooperative has changed? How?**
- **(For long-time users) What have been the most significant events in the life of the cooperative?**

BOARD OF DIRECTORS

- **Have you ever been part of the board of directors?**
  - Why yes/no?
- **Would you like to participate in the board?**
  - Why?

FUTURE

- **How do you see the future of the cooperative? Do you think it will stay independent?**

Appendix 5: Interview guide for state officials

These are the themes that were treated in each interview. Probing questions were tailored to each interviewee.

- What is the role of your agency/unit?
- What is the main aim of your agency/unit?
- How this agency/unit influence water governance in Cochabamba and/or at the Bolivian level?
- What projects does this agency/unit carry out in Cochabamba and/or at the Bolivian level?
- What relationship does this agency/unity has with communitarian providers in Cochabamba and/or at the Bolivian level?
- What do you think of communitarian providers?
- What are the main issues connected with water/sewage provision in Cochabamba and/or at the Bolivian level?
- What changes have there been in the last years in water/sewage provision in Cochabamba and/or in Bolivia?

Appendix 6: List of interviews for the head/representative of cooperatives

COCHABAMBA
Virgen de Guadalupe, North Zone (2) 29.11.2013 (interrupted and continued the 02.12.2013) – 26.06.2014 Interviews with two different presidents (change due to elections)
Nuevo Amanecer, South Zone (1)

05.12.2013 Interview with Administrator
Primero De Mayo, South Zone (1) 21.11. 2013 Interview with President
Candelaria, North Zone (2) 30.11.2013- 28.08.2013 Interview and re-interview with the President
Coña Coña, West Zone (1) 08.04.2014 Interview with the administrator
SACABA
Quintanilla (1) 11.11. 2013 Interview with the president, for re-interviews, see **Case Study**
San Pedro Magisterio (1) 26.11. 2013 1 interview with the president, for re-interview, see **Case Study**
Arocagua-Puntiti (1) 11.08.2014 Interview with the President
Puntiti (1) 08.06.2014 Interview with the President and two members of the Board of Directors
Los Huertos (2) 22.11. 2013– 14.05.2014 Interview and re-interview with the administrator
Chacacollo Oeste (2) 25.11. 2013– 14.05. 2013 1 interview with the administrator, 1 with the accountant
San Jose De Koripila (1) 13.12.2013 Interview with the administrator
Chacacollo Grande (1) 29.03. 2014 1 interview with the president together with the vice-president
Nueva Betania (1) 31.03.2013 1 interview with the president together with the vice-president
COLCAPIRHUA
San Lorenzo (1) 11.12. 2013 1 interview with the president together with the vice-president
Sausalito (2) 26.10.2013– 25.07.2014

1 interview with the administrator and 1 interview with the president (the president of the cooperative is also the president of FECOAPAC, other interviews carried out with him on the subject of FECOAPAC are included in the FECOAPAC interview list)
13 Noviembre (2) 09.12.2013 – 16.06.2014 Interview and re-interview with the president
QUILLACOLLO
Villa Urkupiña (2) 20.11. 2013– 09.06. 2014 Interview and re-interview, both time most of the board of directors was present
Quechisla (2) 03.12. 2013– 05.06.2014 Interview and re-interview with the president of the cooperative (the president is also one of the officials of FECOAPAC so that the re-interview is also included in the FECOAPAC interview list)
Llauquinquiri (1) 13.04.2014 Interview with the President
VINTO
El Porvenir 27.03. 2014 Interview with the president
OTHER **(Interview with cooperative that are part of FECOAPAC, but are not based in Cochabamba Metropolitan Area)**
Capinota 02.12. 2013 Interview with administrator
Arani 28.11. 2013 Interview with the administrator and the president of the cooperative

COOPERATIVES SANTA CRUZ
SAGUAPAC (1), 06.02.2013, Interview with the responsible for public relation
COOPLAN (1), 06.02.2013. Interview with the administrator
COPASIR (1), 07.02.2014. Interviewed the administrator

COOPERATIVES LA PAZ
President Federation of Water cooperatives of La Paz and of the Cooperative Las Nieves (1), 07.03.2013 Interview with the president
Water cooperative Cotahuma (1), 06.03.2014 Interview with the president

Appendix 7: List of interviews for the federation of cooperatives

FEDERATIONS OF COOPERATIVES
FECOAPAC (Departmental Federation of cooperatives for potable water and Sanitation Cochabamba) President: 26.10.2013 – 13.11.2013 - 12.08.2014 Director 1: 15.12.2013 - 26.08.2014 Director 2: 05.06.2014 First president of the Federation: 17.06.2014 Legal Consultant: 07.06.2014
FEDECAAS/ FENCOPAS (Departmental Federation of Potable water and Sanitation Santa Cruz /National Federation of Cooperatives and Providers of Water and Sanitation Services) 07.02.2014 – 01.09.2014. Interview and re-interview of the president of FEDECAAS, that is also the president of the FENCOPAS
FEDECOAP (Departmental Federation of Water Cooperatives of La Paz) 06.03.2014. President of the Federation.

Appendix 8: List of interviews with consultants, NGO officials, academics

NGOs
Fundación Abril, Bolivian NGO 26.03.2014 – 11.08.2014 – 28.12.2013 3 different NGOs officials, one of those is Oscar Olivera
Aguatuya, Bolivian NGO 25.11.2014
Agua Sustentable, Bolivian NGO 24.02.2014
Fundación Avina, South American NGO, 07.01.2014
Red Habitat. Bolivian NGO, 07.03.2014
Cevi, Italian NGO 09.05.2014
ASICASUDD-EPSA, Umbrella Association of Cochabamba Communitarian Providers, 07.04.2014
ACADEMICS
Carlos Crespo, UMSS[37] – CESU 25.02.2014
Rocio Bustamante, UMSS – Centro Agua 27.11.2013
Torres Scarlett, CEDIB 29.11.2013
Carmen Ledo, UMSS – CEPLAG 17.12.2013
Jenny Rojas, UMSS – Chemistry Department 09.05.2013
Raul Ampuero – UMSS - Centro Agua 05.08.2014 – 11.04.2014
CONSULTANTS
Ex-director of SEMAPA, 18.03.2014
Water services consultant 06.12.2013
Engineer, technical designer of the waste water treatment plant of San Pedro Magisterio 11.04.2014

[37] Universidad Mayor de San Simon, Cochabamba Public University

Appendix 9: List of interviews with state officials

Interviews with officials of Central State Agencies

LA PAZ
AAPS, 23.01.2014 –23.01.2014 – 23.01.2014
EMAGUA, 24.01.2014
SENASBA, 23.01.2014 – 20.08.2014 Interview and re-interview with the same official
Vice-ministry for Potable Water and Basic Sanitation, 21.01.2014 –19.08.2014
General Directorate for Cooperatives, 10.01.2014
COCHABAMBA (Departmental offices of Central State Agencies)
AAPS, 28.10.2013 – 04.11.2013, I did two rounds of interviews, interviewing the same two people two times
EMAGUA, 12.03.2014 – 24.04.2014, interview and re-interview with the same official
FPS, 14.13.2014
General Directorate for Cooperatives, 20.01.2014
SANTA CRUZ (regional offices of the Central State Agencies)
AAPS 07.02.2014

Interview with a Bolivian senator, 03.02.2014

Interviews with Agencies of the Cochabamba Departmental Government

COCHABAMBA (Agencies of the Regional Government)
Basic Sanitation Unit, 15.07.2014 – 16.012014 Interview and re-interview
Unit for the planification and integrated management of water 28.01.2014 (interrupted and continued the 24.02.2014)

Unit for the environment, 12.03.2014 -11.08.2014-30.01.2014
four people interviewed, two on the first date and another on the second
Ex-official unit for the environment 03.07.2014

Interview with officials of Municipal Governments

COCHABAMBA
SEMAPA (Cochabamba Municipal water and sewage service) • **Sewage planning unit** 19.04.2014, (two people interviewed) – 07.07.2014 (re-interview) • **Potable water planning unit**, 07.01.2014 • **Environmental unit**, 07.07.2014 • **Legal unit**, 10.06.2014 • **Official working in the waste water treatment plant of Alba Rancho,** 20.06.2014
SACABA
EMAPAS (Sacaba Municipal Water and Sewage Service) • **Manager** 30.10.2014 • **Sewage planning Unit** 19.05.2014 – 08.05.2014 (re-interview) • **Potable Water Planning Unit** 19.05.2014 • **Legal Unit** 17.07.2014 • **Administrative** Unit 19.05.2014-19.05.2014 **Unit for Urban Development** 03.07.2014
QUILLACOLLO
EMAPAQ (Quillacollo Municipal Water and Sewage Service) • **Administrative unit** 29.01.2014 • **Legal Unit** 29.01.2014 • **Technical Unit** 22.08.2014
COLCAPIRHUA
Basic Sanitation Unit of Colcapirhua • **Director** 23.03.2014
VINTO
Basic Sanitation Unit of Vinto • **Director** 27.03.2014
TIQUIPAYA
Basic Sanitation Unit of Tiquipaya • **Legal Unit** 26.05.2014 • **Director** 26.05.2014 • **Technical Unit** 26.05.2014

NOTE: Interviews with state officials of District 2 are included in Appendix 10.

Appendix 10: List of interviews for the case study in the District 2 of Sacaba

This is a list describing the different actors I interviewed in District 2 of Sacaba. It was difficult, however, to separate different kinds of actors, as the same respondent might have multiple roles. For example, in some case, the OTB would also act as a water provider, and therefore the president of the OTB is also the president of the water provider. In this case, I usually prepared two sets of questions for the interviewees, aiming to understand the role of both the OTB and the water provider and the way the two interact. In some other cases, the OTB and the water provider are separate entities but the president of the OTB might also act as a director of the water provider. In the case that an interview is also mentioned elsewhere I will make it clear.

WATER PROVIDERS DISTRICT 2

I have collected data on the water providers of District 2. During my first and second trips to the district, I tried to pinpoint their existence and location (signed on a map) and, when possible, I collected basic information in a survey. In some cases, I carried out in-depth interviews. In this list, I included also the cooperatives. However, detailed information on the interviews carried out therein can be found in the list of interviews carried out with the cooperatives.

NAME	DATA COLLECTED
WATER COOPERATIVES	
Water and Sewage Cooperative Quintanilla Ltda.*	Case study (see Case Study Quintanilla)
Water and Sewage Cooperatives San Pedro Magisterio Ltda.*	Case study (see Case Study San Pedro Magisterio Ltda)
Potable Water Cooperatives San Jose Koripila Ltda.*	1) Map 2) Survey 3) Two interviews with the administrators
Potable Water Cooperative Arocagua Puntiti Ltda.*	1) Map 2) Interview with the President

Potable Water Cooperative Chacaollo Oeste Ltda.*	1) Map 2) Survey 3) Interviews with: administrator, accountant and secretary
Water and Sewage Cooperative Chacollo Grande Ltda. *	1) Interviews with the president (2 times) 2) Survey 3) Map
Potable Water Cooperative Puntiti Ltda.*	1) Interview with president 2) Survey 3) Map
OTBs THAT PROVIDE THE WATER SERVICE[38]	
OTB 27 de Mayo	1) Map 2) Survey 3) Interview with president 28.07.2014
OTB Bolivia[39]	1) Map 2) Interview with president 23.07.2014
OTB Colaypato	1) Map 2) Interview with presidents 07.07.2014
OTB Quintanilla Sud[40]	1) Map 2) Interview with president 27.07.2014
WATER ASSOCIATION/COMMITTEES	
Water Association Oriental- Edén	1) Map 2) Survey
Water Association Amancayas	1) Map 2) Survey
Water Committees of the North	1) Map
Water Committees Huayllani	1) Map 2) Partial Survey
Water Committees Puntiti Norte	1) Interview with the President 07.04.2014
GATED NEIGHBOURHOOD	
SIDUMMS SUD (also an OTB) **	1) Map 2)Survey 3) Interview with the Administrator 26.06.2014
SIDUMMS NORTE PLAN A (also an OTB)	1) Map 3) Interview with the administrator 16.07.2014
SIDUMMS NORTE PLAN B (also an OTB)	1) Map 3) Interview with the administrator 17.07.2014
URBANIZACION MAGNOLIA	1) Map 2) Interview with administrator 27.06.2014

[38] In this list, I have not inserted gated neighbourhoods that are also legally recognized as OTBs, preferring to list them separately as enclosed neighbourhoods, as I believe that to be their primary characteristic.
[39] The OTB Bolivia receives the sewage service from the Cooperative Quintanilla, so the interview with the president is also present in that list.
[40] The Quintanilla Sud territory has two water networks, the other one is from the Cooperative Quintanilla, so that the interview with the president of the OTB is also listed in the interviews done for the case study of the cooperative.

URBANIZATION EL VERGEL (also an OTB) **	1) Map 2) Interview with the administrator 3) Interview with the president 10.07.2014
URBANIZACION LOS PINOS (also an OTB) **	1) Map 2) Survey 3) Interview with the Administrator 26.06.2014
URBANIZACION LAREDO **	1) Map 2) Survey 3) Interview with the administrator 06.06.2014
URBANIZACION EL CASTILLO (also an OTB)	1) Map 2) Interview with the president 27.06.2014
URBANIZACION SANTA MARIA	1) Map

* These Cooperatives are also mentioned in the list of Water Cooperatives interviewed in Cochabamba Metropolitan Area.

** These neighbourhoods do (or, in one case, did) receive the sewage service from the cooperative Quintanilla, so they have been interviewed also on their relationship with the cooperative.

OTHER ACTORS OF DISTRICT 2

NAME	DATA COLLECTED
Vice-Mayor	30.07.2014
Vice-Mayor and ex-president of the OTB San Pedro Magisterio	12.05.2014 – 06.08.2014 (Interview and re-interview)
President of the Association of OTBs (also President OTB San Jose de Koripila)	13.05.2014 -29.07.2014 (Interview and re-interview)
President Association of Irrigators of District 2 (also a director of the OTB Arocagua Chiljchi)	19.07.2014

Appendix 11: List of interviews for the case study of the Quintanilla cooperative

Here, I provide an overview of the different actors interviewed. I underline, as in the case of District 2 actors, that in some cases, actors might overlap, or the same actor might have more than one role.

PRESIDENTS OF OTBS IN THE TERRITORY OF THE COOPERATIVE

OTB Quintanilla Este	Interview president (also president of the Cooperative Quintanilla, see case study)
OTB Quintanilla Central	Interview with the president (also an elected officer of the cooperative Quintanilla), 24.07.2014
OTB Quintanilla Oeste	Interview president, 29.07.2014
OTB Paraiso	Interview Vice-President, 26.07.2014
OTB Quintanilla Sud	The OTB is partially served by the cooperatives but it also has an independent water provider, this interview was then already listed in the list of water providers of District 2

WATER USER

I interviewed 48 water and/or sewage users. I also interviewed 1 non-user that was waiting to receive the service.

DIRECTORS/EMPLOYEES

Board of Directors	
President of the cooperative	10.09.2013
Vice president	04.07.2014
Treasurer	22.05.2014 – 02.08.2014
Secretary of Minutes	21.05.2014
President of the supervision council	24.07.2014
Vice-president supervision council	20.07.2014
Spokesperson supervision council	24.06.2014
Ex-president Cooperative	15.08.2014
First President of the Cooperative	04.09.2014
EMPLOYEES	
Secretary	21.05.2014- 07.08.2014
Meters reader	20.05.2014
Accountant	21.05.2014
Plumber	19.07.2014

Appendix 12: List of interviews for the case study of the San Pedro Magisterio cooperative

WATER/ SEWAGE USERS

- 42 water and/or sewage users of the Cooperative San Pedro.
- 4 people that live in the territory of the OTB San Pedro Magisterio but receive water from EMAPAS

MEMBERS OF THE BOARD OF DIRECTORS

BOARD OF DIRECTORS

President of the cooperative	09.08.2014
Vice president Administration Council	23.05.2014
Legal Counsellor	30.05.2014
Vice-president Supervision Council	28.05.2014
Member Supervision Council	28.05.2014
Member Administration Council	14.06.2014 – 27.06.2014
Member Supervision Council	29.05.2014
First President of the Cooperative	24.07.2014
EMPLOYEES	
Secretary	08.08.2014
Administrator	24.08.2014
Plumber	20.05.2014- 17.07.2014
OTB	
Vice President	11.06.2014-06.08.2014
Ex-President	6.08.2014 (plus 1 previous interview as Vice-mayor of the district)

OTB

OTB San Pedro Magisterio	1) Interview president (also president of the Cooperative San Pedro Magisterio) 2) Interview vice-president 23.05.2014 – 06.08.2014