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Water conflicts hydrocracy in the Americas : coalitions, networks, policies

Franck Poupeau, Lala Razafimahefa, Jérémy Robert, Delphine Mercier, Gilles Massardier, Pedro Jacobi

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Water Conflicts and Hydrocracy in the Americas

Coalitions, Networks, Policies

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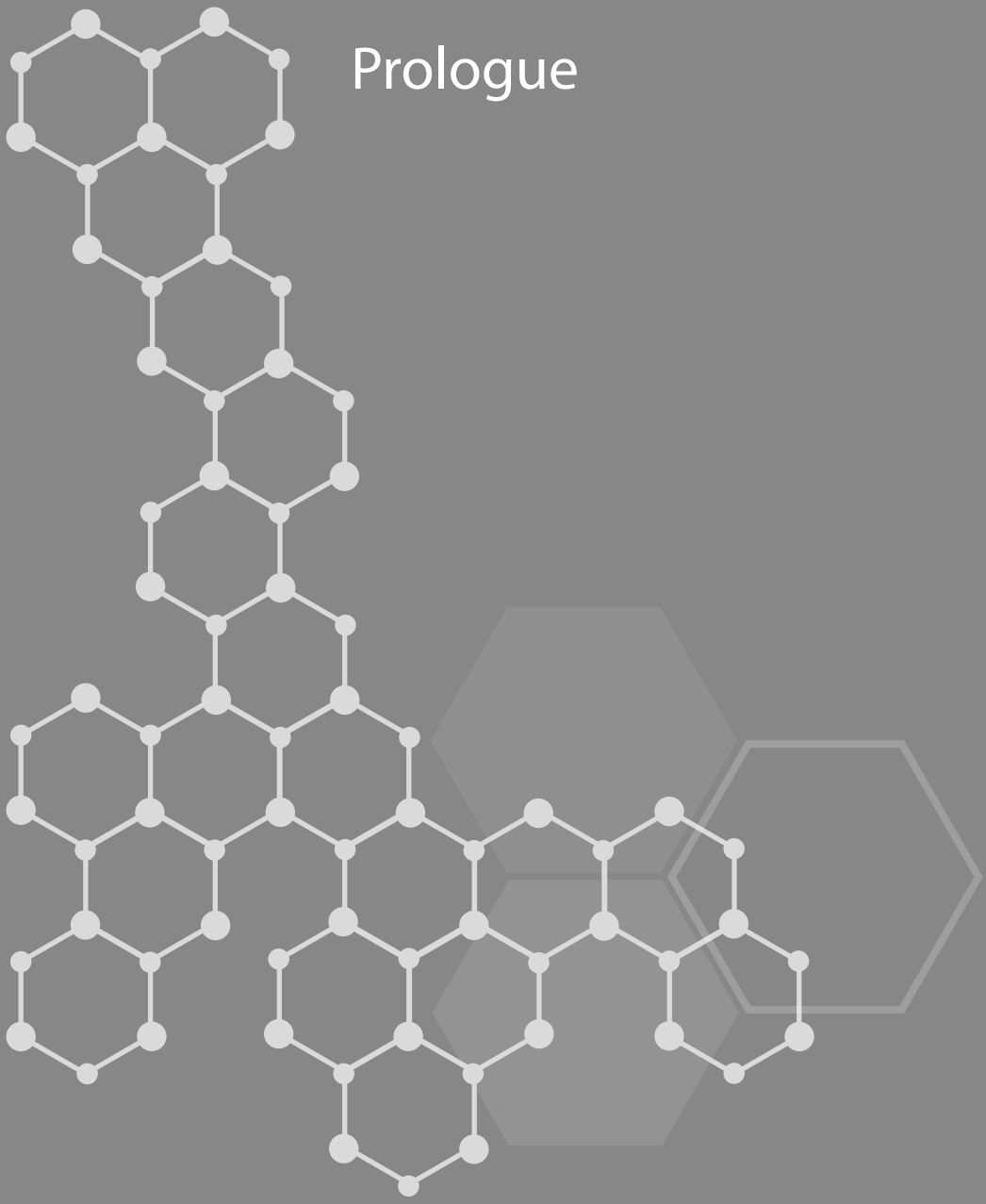
Prologue



BEYOND "WATER WARS"

The Editors

It is generally admitted that in "a world of inequalities" (Badie & Vidal, 2017) the poor are the ones who suffer most from worsening environmental conditions, and, in particular, from the effects of the "ecological transition" (Zarka, 2017). This observation arises the idea that the unequal distribution of environmental costs explains the increase in the number of conflicts in which the poorest populations express anger and frustration at their inability to access decision-making bodies (Maertens, 2017). However, social science research on these kinds of conflicts cannot content itself with simply observing the existence of inequality, mechanically just as implicitly, linked to the protest movements it provokes in a context characterized by the "global water crisis" (Bakker, 2010). In effect, those conflicts are multiple (Castro, 2017). They not only pit resident populations (organized in varying degrees and, similarly, also the object of varying degrees of discrimination) against, naturally enough, the institutions responsible for looking after them, but also involve various professional bodies (civil engineers, biologists, etc.) responsible for developing water policy or managing urban networks. Those conflicts play out not only at the level of representations, but also of uses (in the fields of agriculture, industry, urban development and, notably, energy). The analysis must, therefore, start by considering the possibility of defining those conflicts as a series of struggles that are at once indissociably social, political and scientific.

Some studies have criticized the – extremely widespread – use of the notion of "water wars" as a hermeneutic for conflicts concerning the resource. If "all water management is multi-objective and is therefore, by definition, based on conflicting interests" (Delli, Priscolli & Wolf, 2009: 10), one needs to take into account the fact that conflicts do not inevitably lead to confrontation, and that – at least in terms of cross-border disputes – questions of water distribution generate as many, if not more, legal solutions or negotiated compromises than open conflicts. The trope associating, on the one hand, an increase in demand for water caused by urbanization and demographic growth, and, on the other, climate change and the scarcity of the resource in arid and semi-arid zones (Heat, 2003) should, therefore, be recast as an analysis of institutional modalities dedicated to water management. Social science research cannot be satisfied with (neo)institutional analyses based on the "governance of the commons" (Ostrom, 1990), which place local negotiations (carried out at the local scale) at the center of the analysis. The challenge of this research involves understanding both the conflict inherent in these modes of management and the plurality of factors potentially impacting the approaches applied by "water protagonists".

Similarly, Bernard Barraqué (2011) describes the degree to which the shared vision of "water wars" is largely based on a confusion between water resources and the water distribution service. According to the author, the expression encourages "the erroneous assimilation of water to a mineral like gold or oil, vital, certainly, but renewable and always changing. In the majority of countries, most water is not appropriable, even by governments, and is thought of as something common to its users that should be shared in a reasonable manner". This confusion leads to grouping very different conflicts together under the same banner, even though they are, in effect, characterized by factors that are simultaneously diverse, embedded, and more complex than such an approach would suggest. Consequently, the approach taken in this book focuses resolutely on problems associated with access to urban services, rather than on territory-based and cross-border quarrels about rivers and groundwater.

The analysis of conflicts over water faces other epistemological obstacles. Particularly in the "countries of the South(s)", the literature shows such conflicts serve as an opportunity to idealize local struggles involving residents, particularly indigenous residents, and their motivations. The fact that studies are often limited to the "voices" of the dominated[1] and the narrative of past events – itself reconstructed based on the stories of the conflict protagonists themselves – makes it impossible to take a step back from this enchanted vision, a vision that gathers strength from the social emotions it arouses and that bolsters its scientific legitimacy by applying universal anthropological arguments such as "water is life". It should therefore be noted that, in most contexts, these conflicts have become visible thanks to militant narratives about "water wars", whose increase in number since the 1950s has focused attention on one of the most sensitive environmental issues of the moment, namely water insecurity, which can be defined in regard to a combination of climatic factors and the vulnerability of populations, and which is capable of generating "hydro-political risks" when competition for water is not institutionally regulated (Molinga, 2008: 12; Blanchon, 2017: 76). It was the Cochabamba episode in 2000 – the expulsion of the company Bechtel after supplies to the city were blocked – which did most to shift the focus onto the ineffectual nature of privatization policies in the "Souths", of which Latin America has, in a sense, served as a kind of situational avant-garde (Poupeau 2008; Robinson, 2008).

In effect, Latin America is at once the most urbanized and most unequal of the world's continents in terms of access to water, particularly on the outskirts of its expanding metropolises (Davis, 2006; Aguilar-Barajas et al., 2015; Dupont et al., 2015). However, few observers of the "turn to the left" in countries like Bolivia,

1 In effect, these are the most accessible protagonists on the ground in that, in most cases, the organizations representing segregated populations rely on researchers to provide them with support and legitimization. Other protagonists, notably water bureaucracies, are obliged to make a sustained effort in order to acquire access to decision-making spheres.

Brazil, Ecuador and Venezuela (Brisset-Foucault, 2006; Levisky & Roberts, 2011; Dabène, 2015) have commented on the concomitance of political change with the development of protests concerning natural resources and their re-appropriation by national and communitarian institutions. Insofar as countries that have remained on the "right" are concerned, they rarely feature in the overall picture of conflictuality (Klandermans & Van Stralen, 2015). In fact, it is above all in the field of environmental injustices concerning the poorest populations of Latin America that "an alternative approach to development" (Labarthe, 2017: 225) has been elaborated. The denunciation of a "predatory *rentier* economy" is, therefore, based on a focus on "new vulnerabilities" caused by the destruction of ecosystems, soil erosion, and uncontrolled mining activities (Budds & Hinojosa, 2012). Conflicts concerning water have been confined to a field of expertise restricted by the limits of the territories studied and the engineering solutions applied (Barraqué, 2015).

There are also epistemological obstacles to overcome in studies of the "countries of the North", where conflicts concerning water are particularly prone to ideologization due to the opposition between ecological movements and advocates of the private sector. However, the public-private dichotomy by no means covers all the management approaches implemented (Lorrain & Poupeau, 2016), as is demonstrated by the case of the Colorado Basin in the United States. Issues concerning water distribution are especially acute since prolonged drought in the region has impacts not only on relations between states (mainly Arizona and California), but also within states, where threats of water shortages affect both the development of agro-industry and the provision of water to expanding cities. In spite of economic and political structures that are radically different from those of Latin America, water insecurity in the US generates a high degree of conflict. However, this conflict is not characterized by the kind of polarization inherent in the most highly publicized protest movements but is much more likely to be situated within the institutions responsible for regulating the environment (Worster, 1992). In this comparative international perspective, the idea of "water wars" obscures one aspect of conflict, namely the internal struggles in the bureaucratic sphere over the ability to define and impose which water policies to apply (Poupeau et al., 2016).

These factors encouraged us to shift the analysis – initially focused on claims addressed to various governments via the protests of resident populations, often provoked by contaminated water, unequal access to the service, or a rejection of corporate privatization (Finger & Allouche, 2002) – to an examination of water management models involving complex administrative structures, which are referred here as "hydrocracies" (Molle, Molinger & Wester, 2009), simultaneously dedicated to urban services and embedded in issues of power which surpass them. The research thus transitioned from a local narrative, characterized by extremely polarized situations, to an analysis of social logics informing and institutions overseeing the implementation of water policy in specific national bureaucratic fields. While most

struggles concerning water occur at the local level, their causes mirror logics played out at other levels: the norms associated with management models are national and international, both in terms of uses and of transfers of skills (Conca, 2005; Gupta & Pahl-Wostl, 2013).

This kind of comparative analysis of environmental conflicts questions approaches taken in the social sciences. Beyond the specificity of their object, they imply an original relationship with different fields of enquiry. The fact that they are at once local and global, and the various levels of action, and, therefore, analysis involved, prompted us, rather than to concentrate on a monographic study of well-defined territories, to apply an approach at once collective and comparative in terms of both methods and objectives. From this point of view, the work presented in this book is an attempt to develop new research approaches. The goal is not to downplay the need for work on the ground but, rather, to analyze specific case studies in the perspective of the modelization of factors determining conflictuality. This is the objective of the methodology developed by the researchers of the BLUEGRASS project, which has funded research teams in the United States, Mexico, Peru, Bolivia and Brazil[2]. A dozen terrains have been selected with a view to providing a wide range of conflicts concerning water in urban and peri-urban contexts.

Faced with the task of finding a shared framework capable of linking various case studies, we initially decided to focus on the "Advocacy Coalition Framework" approach, which analyses networks of protagonists involved in elaborating public policy (Sabatier & Jenkins, 1993; Lemieux, 1998), and which has been applied in numerous studies on environmental policy (Munro, 1993). On the one hand, this framework presents the advantage of being relatively flexible and adaptable to a large variety of empirical situations (Weible & Heikkila, 2017), and, on the other, makes it possible to apply qualitative and quantitative methods, which can be transposed onto different terrains (Weible, Sabatier & McQueen, 2009). A questionnaire was established in order to provide each team with shared variables.

The questionnaire has two objectives. First, to avoid placing excessive emphasis on national differences, which would constitute a different project in and of itself (for example, the Bolivian state has nothing to do with the US federal structure), but which could, above all, hinder work on the ground due to an exaggerated concern in how to compare systems characterized by specific histories and modes

2 The BLUEGRASS project *(Struggles for Blue Gold': From Grassroot Mobilizations to International Policies of Environment)* was funded by the *Agence Nationale de la Recherche Francaise* coordinated by UMI iGLOBES (CNRS/University of Arizona), and support 13/50537 – by Fapesp (Fundação de Amparo à Pesquisa do Estado de São Paulo) in collaboration with CIRAD (Centre de Coopération Internationale en Recherche Agronomique pour le Developpement, France), CEMCA (Centro de estudios mexicanos y centro americanos), Mexico, UMIFRE 16, CNRS/MAEE), IFEA (Instituto Frances de Estudios Andinos), Peru UMIFRE 17, CNRS/MAEE) and Instituto de Energia e Ambiente da Universidade de São Paulo, (Brazil).

of functioning; and second, to provide a basis for simultaneously discussing and exploring factors influencing specific situations. Rather than attempting to isolate statistical regularities, institutional and social configurations in which individual management models and their specific characteristics reveal a series of definitions enabling to interpret the causes of conflicts and develop an explanatory model. "The study of the politics of water is therefore a rather dispersed field of research, organized in strongly regionally and sector wise defined clusters, apart from being disciplinarily divided. The expanding amount of work on the political dimensions of water resources management, however, allows a degree of systematising and abstraction (…). The added value of the comparative dimension is that the systematic and contextualised comparison of (typically a small number of) cases allows for a very intensive dialogue between theory and evidence (…). What is suggested is comparative analysis of specific structures and mechanisms (also called theoretical generalisation), through detailed analysis of the processes they help to generate and avoid the positivist pitfall of generalisation at the level of events" (Molinga, 2008).

It is always possible to view such objectives as contradictory. Indeed, aren't all conflicts concerning water anchored in a specific territory and a particular socio-economic system? Isn't the desire to find comparable structures tantamount to abandoning the attempt to discover the political significance of individual struggles? But this would be a misinterpretation – no doubt linked to the disciplinary frontiers that generally characterize research on water, and which place the local, seen as a territory or a mode of governance (Ostrom, 1990; Schneier-Madanes, 2014) at the center of the analysis – of the function of modelization in the social sciences. This function does not consist exclusively on determining quantitative variables, but it also uses concepts to explicitly identify explanatory variables that have either been ignored or implicitly left to one side. The value of modelization conceived of in this way as an exploration of potentialities lies in the fact that it reveals systems of significant relations and correlations, making it possible to determine effects and develop explanatory hypotheses (Bourdieu, 2012). But the flexibility of a framework of analysis only has scientific virtues if that framework is sufficiently reflexive. A theoretical model whose limits are known and integrated into the analysis is more valuable than no framework at all; and the collective reflexivity exercised on the ground makes it possible to develop that framework and correct its limitations. And, while, to apply Bachelardian terminology, "nothing is given, everything is constructed", the international comparative approach can be legitimately considered as a progressive and controlled development of the scientific object.

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Introduction

Water conflicts in the Americas: a comparative model of multi-level policy coalitions

Annex 1 • Methodological grid

Annex 2 • Water Policy and Technical Systems in Brazil

A public meeting in Cochabamba, during the « Water War » (2000).

WATER CONFLICTS IN THE AMERICAS

A comparative model of multi-level policy coalitions

The Editors

This book proposes an approach to environmental conflicts related to urban water management and the policy-making into which they fit, based on the concept of multi-level coalitions. The aim is to understand how water conflicts influence policies, based on two hypotheses. A first hypothesis is that *water-related policies arise from local conflicts, which structure coalitions* taking differentiating stances on specific issues like water prices, installation of a new water collection system, negotiation of a new commissioning contract, the municipal plan of water, etc. A second hypothesis is that *the resulting local orders are embedded at multiple levels of stakes and social practices* (territorial, national, international). Indeed, the environment is subject to multi-level regulation (Hooghe & Marks, 2003), defined as interaction, reinforcing and colliding rule-making and governance at the international, federal, and city/local community levels. It emerges from varied top-down, bottom-up, and negotiated processes within the state, among states, regions and cities, and among economic and social interests (Doern & Johnson, 2006).

Several case studies have been selected in order to test these hypotheses and to develop a comparative framework. They are conflicts centring on issues associated with water (distribution, provisioning, collection, sanitation, etc.) in some cities in the Americas (Bolivia, Brazil, Mexico, Peru, USA). The focus on such conflicts corresponds to the need to take into account both the political dimension of environmental problems and the ecological conditions (territorial, spatial, economic, etc.) of their emergence (Fontaine, 2009; Barraqué, 2011). More generally, the sociology of environmental conflicts was first developed around the issues of contamination and environmental justice: for instance, Laura Pulido (1996) characterized them as being subaltern struggles of minorities against forms of labour exploitation. David Pellow and Lisa Sun-Hee Park (2002, 2011) revealed that these conflicts could involve high-tech zones such as Silicon Valley where migrant workers are the most exposed to environmental inequalities. Wendy Espeland (1998), in turn, showed, during conflicts caused by the Orme dam in Arizona in the 1970s, how collective identities grew up against the rational choices of the bureaucracies involved.

Protest movements can also be linked to the construction of the environment as an international issue, whether be it struggles leading to laws for the protection of the ozone layer (Cannan & Reichmann, 2002), struggles to impose health procedures or legal norms with regard to contamination or nuclear waste (Kamienecki, 1992; Vick & Axelrod, 1999), or, since the turn of the 21st century, transnational struggles for the right to water (Bakker, 2011). In France, environmental engagements have been analysed as being part of wider ecologist or alter-globalist movements, struggling against neoliberal privatization (Frour, 2004; Ollitrault 2004; Milani & Keraghel, 2007). The approach presented in this book integrates the contributions of these different researches, while developing a specific theoretical and methodological perspective at the articulation of four analytical challenges.

The first is to reposition social struggles for access to water at the core of the analysis of water policy. This orientation is intended to set itself apart from Neo-Malthusian analyses of the "tragedy of commons" (Hardin, 1968), which diagnose the depletion of natural resources by linking it to the lack of a rational social organization, and from institutional approaches that blame ecological crises on governance defects (Ostrom, 1990). The second challenge is to analyse the effects of the ecological transition, including climate change, as simple socio-political issues arising from processes of water appropriation by protagonists that often give rise to conflict. The third challenge is the absolute need for a multi-level reading of the logics of action, which is not confined to the territorial or, conversely, international dimensions of environmental policies; and not only does the national level also play its role, but the interactions between all these levels are a variable that also has to be taken into account. These multi-level policy coalitions are not superimposed interdependency systems within networks of different levels hierarchically linked to each other (Lazega, 2008): policy coalitions defined here form a single system that transcends action levels. The fourth challenge consists in enquiring into the apparent contradiction between strengthening the heterogeneity of policy interests and logics on the one hand, and creating relatively uniform spaces of power and policy making on the other. To that end, the concept of multi-level policy coalitions makes it possible to develop qualitative and quantitative analyses of the groups of social and institutional protagonists struggling for the same public policy issues.

Background: social conflicts for water in the Americas

Inequalities in access to water

The conflicts for access to water involve social movements, but also institutions and lasting policy processes (Wildavski & Pressman, 1972; Massardier, 2008; Hill, 2011). Since the 2000's, most of the attention has been paid to the struggles

against privatization of water services in Latin America, as this region has been a privileged site for the international expansion of European (and especially French) multinationals (Weyland, 2004; Bonin, 2005). These companies have been greatly influencing world urban water policy since the 1980s, not only by conquering these markets, but also by disseminating a set of internationally acknowledged technical, economic and legal rules (Lorrain, 2005). In this context, protest movements against the privatization of natural resources (water, gas) have revealed some major transformations in environmental regulation, bringing onto the scene various action levels (relations between States, international organizations, private companies, national authorities and representatives of civil society) (Abers & Keck, 2013). These levels contribute to a process of international import-export and adoption of the "French model for water" (taken to be both a tradition of private management of urban water services and as concerted river basin and independent agency)[1].

International environmental expertise is drawing attention to the increasing pressure and stress on water resources (Belmont Forum, 2011a; Blanchon, 2017). With 33% of global water resources (around 28,000 m^3 per inhabitant per year), Latin America is quantitatively well provided (FAO-AQUASTAT, 2013). However, even this region is dealing with some major difficulties. Firstly, water availability varies considerably depending on places and seasons. The situation in the Andes stands out from the recurrent droughts in Mexico and northeast Brazil. Also, physical availability must be distinguished from economic availability, which depends on the quality of infrastructures, conveyance and potabilization costs; from this point of view, all the Latin American countries are set to face water stress by 2025 (IWMI, 2007). Moreover, Latin America has stood out from the other world regions by the extraordinary rapidity of its urbanization process, which is approaching 80% – more than Europe and the United States, and almost twice than in Africa and Asia. Lastly, the interest for Latin America water wars has been emphasized by the emergence of protest movements that have been perceived as being at the forefront of the social protests against "global capitalism" (Robinson, 2008; Levistsky & Roberts, 2011).

This situation is bound to fuel inequalities in access to water, be they economic or political: what has been called "blue gold" (Barlow & Clarke, 2002) is now at stake in the struggles, not only for its appropriation but also for defining its most efficient and most legitimate management methods, especially in terms of environmental justice (Baron, 2007; Durand & Jaglin, 2013). Exposure to

1 What has been known as the French model is the outcome of a specific historical construction, within which the internationalization of the final decades of the 20th century appeared as a factor of adjustments and reorganization. French water management was exported in two ways: private management of urban water services under the impetus of the French water *majors* which capture the global markets, and the laws of 1964 and 1992 (catchment areas, agencies, committees) which have inspired many foreign laws, including those in Brazil and Mexico (Brun, 2006).

environmental changes tends to be greater for those living in the disadvantaged suburbs of large cities or rural and urban areas, which most of the time have the least access to local decision-making processes. In Southern countries, the poorest populations pay a high price for a poor service in terms of quality. Neither do they have access to wastewater drainage systems, as in Latin America, where almost 80% of the population is apparently without access to quality sanitation (World Bank, 2009). Notwithstanding there is no guarantee that environmental policies systematically prove beneficial to the most vulnerable populations. The increasing costs associated with potabilization, treatment, and preserving the quality of springs to the consumer may indeed result in a clear rise in tariffs that are prejudicial to the most deprived categories; likewise, increasing volumetric pricing, designed to reduce consumption, may hit poor and large families.

Struggles relative to tools of urban water policies

In the field of water, as in others, conflicts are an integral part of policy making. It is a challenge to understand, for example, the spatial segregation in the water supply and treatment system, and how it impacts large water production facilities. For example, the state of Rio de Janeiro reveals a specific political and institutional history, characterized by the power of technical groups, politically and entrepreneurially competing for power and financial resources. If the domain of civil engineers remains little challenged (Barraqué, 2017), one has also to understand that social struggles involve institutional shareholders in the public sphere, such as in the case of the State of Rio de Janeiro, between the public company (CEDAE) and the Environmental Institute (INEA) of the Environmental Secretariat.

This recognition of environmental constraints cannot be separated from the debates surrounding the private management of the service. Indeed, and unlike a country such as France where it came about much earlier, private management of urban water and sanitation services was widely presented, in the 1990s Latin America, as a necessary response to the new environmental challenges encountered by the towns in the region (Bauer, 2004). For instance, a policy paper by the World Bank in 1993 highlighted that the increasing scarcity of water, urbanization and economic growth called in return for inseparably economic and environmental management of both the resource and service. It is in this context that the French water multinationals stirred up some major social reactions. In particular, and at a time when companies were trying to pre-empt the sustainable development issue, the reality of their ecological and social management, was largely challenged by its opponents. For example, in Brazil, a National Front for Environmental Sanitation was set up in the 1990s, and it has been questioning several privatization projects.

In addition, the need to rebalance available resources led to an increasing interest in freshwater security issues and unequal access to water affecting the most

marginalized populations in the metropolises and cities of the South and North (Jaglin, 2002; Prasad, 2006; Bakker et al., 2008). In 2009, the World Bank placed the point of articulation of climate change in the ecological regulation of cities, thereby showing itself to be loyal to Agenda 21 adopted at the Rio Summit in 1992, which is the driving force behind some sustainable resource management methods at the territorial government level. However, while a certain number of management principles suggest the emergence of an international regime for water (Little, 2011), no unified international agreement on water exists to date (unlike those on the climate or biodiversity). At the moment, around thirty agencies, bodies, funds or programmes belonging to the United Nations are working to establish water governance, including the FAO, WHO, WMO, UNEP, UNDP, etc. (Sironneau, 2012). Since 2003, UN Water has been attempting to coordinate the different initiatives engaged in by the international organizations of the United Nations. It has also included representatives from the private sector and NGOs envisaging cooperation and issuing of World Reports on the development of water resources, due to the prediction of growing water insecurity caused by the effects of climate change.

Four analytical challenges

Seeing environmental changes as social and political issues

What is commonly named as climate change or ecological transition is as much a material reality as it is a discursive and normative repertoire. An issue of struggles for legitimately defining the principles used to classify the social world, the division between that world and its surrounding nature, along with the regulation of resource use, is finally an issue to define policy categories. For example, Bernard Barraqué (2011) showed that the scarcity of resources is often more a fiction maintained for the purpose of political mobilization rather than a physical reality, and that one must endeavour to grasp the mechanisms of the social production of that scarcity: water conflicts are part of the questioning of service management practices, and of their normative models.

With the increasing metropolization in Europe and Latin America, the problem of the pressure exerted on water by environmental changes is doubtless not constructed and treated socially and politically in the same way everywhere. How does it transform conflicts linked to the use of the resource, especially in an urban context? How does it renew the issue of unequal access to water? How are the environmental challenges re-appropriated, during conflicts, by social movements and the institutions they call upon, to establish new resources and new levers for action? To what degree do the effects of climate change affect, right from grassroots mobilizations, the implementation and even the design of national and international

environmental policies? Is climate change, as an issue, finally the answer to the question of who is governing access to water?

During the 2000's, these conflicts have given rise to a great deal of literature, be it descriptive or activist, which echoes the political impact of the water wars of Latin America (Shiva, 2002; Barlow & Clarke, 2002; Larbi Bouguerra, 2003; Lasserre 2003; Smets, 2004; Sousa Santos & Rodriguez-Garavito, 2005). This has contributed to the success of this topic but has been criticised for the imprecision of the terminology and confusion it has led between resource management and unequal access to the service. For example, Karen Bakker (2011) interprets "water wars" as being a crisis of governance, both public and private, more than a struggle for access to resources monopolized by the distribution companies alone. The OECD (2012) shared this analysis, expressing that the water crisis is very largely a governance crisis.

A study on the implementation of water policy in the current context of ecological transition cannot just settle for analysing the right technical water management; it needs to examine the displacement of conflicts and the social conditions for taking on board new environmental circumstances. Recent social mobilizations around the issues of distribution and unequal access to water in South America have shown that the reception and social acceptability of new policy tools are often glaring omissions from the universal set of water governance (Mayaux, 2015; Lorrain & Poupeau, 2016). Yet, they are actually engaged in, through the effective implementation of water management tools, and particularly in the transformation of the resource into an urban service, from its potabilization to its ultimate discharge, including access to water, its conveyance, its distribution, its drainage, and any treatment. These mobilizations reflect struggles for the delivery of urban water and struggles between urban centres and the surrounding areas that possess the resource. During such mobilizations, the different water protagonists (organizations and social movements, user groups, companies, public or para-public institutions, etc.) use the subject of environmental change and climate risk to mobilize and redefine management methods and policy tools. This produces new representations of the world and advocacy, particularly regarding what affects economic growth, the distribution of its benefits, and the associated lifestyles (Hulme, 2009; Liverman, 2012).

The objective is one of a political sociology of water which does not do away with the power relationships and modes of domination linked to water, unlike approaches in terms of governance which emphasize spaces of negotiation between the different stakeholders, or those in terms of water management, which propose a sort of one best way, socio-technically defined. Policy tools are not seen as issues of power and struggles, but as instruments that are efficiently and rationally defined, according to economic and technical rationalities blended from "social acceptability" procedures. The selection of protagonists within the policy process is through co-opting or excluding the choices of operators and participation

modalities in general (Lorrain & Poupeau, 2016). Yet, where water is concerned, any observer in the fieldwork knows to what degree prior scoping of the definition of policy problems and responses, and of the people who formulate them, precedes (and often determines) policy decisions.

In order to recompose the universe of struggles opened up by water policy issues, the recognition of inequalities in access to water and of shortcomings in their institutional management systems is not enough. It is a matter here of reversing the analysis, beginning with inequalities in the access to decision-making spaces – i.e. policy coalitions – to understand the structure of political and social struggles for water. This perspective sets out to study how the definition of environmental problems and their regulation is a struggle issue rather than a conveyor of stabilized compromises. Consequently, by reducing these conflicts to an opposition between the people in revolt and the government in place, rather than seeing an interweaving of institutions, organizations and social agents struggling to control natural resource regulation policies, and thereby the political power they afford, no doubt comes from the bias induced by some studies of spectacular "water wars" like, for example, those initiated by the broad and successful protest against Bechtel in Cochabamba, Bolivia.

Considering the overlap in levels of public action

The social and political challenges associated with climate change and water cannot be considered on a national or territorial scale alone. The analysis needs to be completed by incorporating the international dimension of environmental policies and the way they are regulated by linking all these levels to each other. The problem is that the existing literature tends to separate the analytical levels. Much of the work on the transformations of world governance of natural resources takes the form of disciplinary approaches without necessarily linking the different levels to each other: the domination of transnational corporations, legal struggles for recognition of the territories of native peoples, the challenging of State powers in the face of regional integration processes, etc. In addition, the literature on conflicts struggles to take into account the role of non-State players in international dynamics.

Firstly, the analysis of territories often seems to be isolated, policies for setting in place socio-technical systems are only dealt with via the logics of territorial development projects and the "desectoralization" of public policies (Ghiotti, 2007; Goxe, 2007; Lippert, 2011). Moreover, the advocacy coalitions approach of Sabatier and Jenkins falls into this category: coalitions are local (Sabatier, 1988; Sabatier & Jenkins-Smith, 1993; Weible & Sabatier, 2005). This work separates off territories from the logics of the higher levels to consider water management seen through the prism of territories, and as a self-sufficient whole. Whether it be a matter of urban or rural water management, conflicts, when considered, are highly localized, amounting

to a deciphering of water sharing between multiple users (Agrawal, 2012). Yet, the water sector is intensely governed by laws, norms and standards drafted at the national level by ministries and agencies. However, insofar as the State remains endowed with the greatest capacity and legitimacy to control and steer the action of large corporations (builders, engineering specialists, operators and subcontractors) and of the other social agents in an environmentally responsible direction (e.g. the water police), it becomes difficult to challenge its centrality (Steinberg & VanDeveer, 2012: 14-15).

Secondly, abundant literature on International Relations tends, in its turn, to isolate the transnational drafting of environmental standards, as it pertains to the international regime to begin with (Krasner, 1983; Rittberger and Peter, 1993). There is also the literature falling into the category of world governance of the environment, which focuses on the role of NGOs, the private sector, international experts and international organizations (Levy & Newell, 2005). Indeed, over the last few decades, a set of experts and institutions has acquired a central role in determining international water policies: international or national civil servants, industrialists, scientists, NGOs, elected representatives, form a veritable "water community" that interpreted the Rio conference in 1992 as a challenge to its action (Meublat, 2001). Since then, organizations intended to coordinate initiatives and inform about the declared war for "blue gold" have mushroomed. Starting in the 1990s, the World Bank, the United Nations, and some international professional organizations from the water sector linked up to try and define a world water vision which was successively embodied by the World Water Council (1994), the Global Water Partnership (1996), the 21st Century World Water Commission (1998), or in various World Water Forums. A multitude of NGOs uses the international arenas, particularly the United Nations, to push for the recognition of a right to water, which would implicate, among other things, a minimum free monthly volume of drinking water compatible with a decent life. These institutions are in addition to the technical and scientific organizations that already existed within UNESCO, the World Meteorological Organization and the various NGOs or professional organizations.

The international summits and counter-summits on water are also ideal observatories for analysing the construction and functioning of this expertise. The meetings of official institutions, NGOs against the privatization of the resource, representatives of so-called original populations, undoubtedly have as much influence over the definition of water policies as the struggles engaged in at local level. One must include within them associations for consumer protection (Public Citizen, Attac), environmental protection (Friends of the Earth, Oxfam, Greenpeace, Peoples World Water Forum, Cry for the Water), and public management (Council of Canadians, Polaris Institute, Danielle Mitterrand Foundation); also collaborates of operators (WaterAid), development, confessional or medical organizations, and those working in other fields of environmental protection (Cohen, 1994; Dumoulin, 2005; Finger, 1994; Vig & Axelrod, 1999; Wapner, 1996).

The idea of public goods on a world scale, as has been accepted by the activist spheres of the environment (Bakker, 2010), do not designate locally threatened services of general interest. But new needs linked to the role of international solidarity and to a rejection of increasing inequalities in the global movement reinforce the multiplication of societal interactions. These articulations implied on the creation by all these organizations of the Peoples World Water Forum at the World Social Forum in Mumbai in 2004, extended in the World Water Forum in Marseille in 2012, which engaged all the components of this water community, including firms. However, these networks should also consider the think tanks set up by the water multinationals, such as the Water Resources Advisory Committee, a committee of international experts created in 2000 by Suez-Lyonnaise des Eaux. Their mandate considers the main challenges facing water and forest resources. Indeed, the multiple levels involved in regulating the water sector find themselves in a relationship with the economic sector of the major distribution firms, within which the French model plays a fundamental role. This complex web of new institutions enables national representatives, industries and international experts to contact each other and promote water as an international priority, be it a matter of sanitation standards, or of defining environmental risks and institutional configurations (public corporations, concessions, public/private partnerships, etc.) transferred from country to country. These "epistemic communities" (Haas, 1992), comprising economists, national civil servants, legal experts and NGO activists, intervene in a decisive manner in this sector to establish water as a common good, eligible to be covered by international legislation or a public good, worthy in this respect of a public service.

Beyond these undeniable contributions, the effect of this corpus of literature is to separate the international level, and to consider others, as only occupying a position subordinated to the global one. The models are understood as being disseminated and imposed from above without taking into account their acceptance by local groups. Lastly, this literature focuses especially on cooperation between transnational actors over and above national contexts, which would thus seem to fade away (Conca, 2006). Policy Transfer Studies (Dolowitz & Marsh, 2000) attempt to escape this criticism by investigating the exogenous dimension of public policies and the circulation of models (Delpeuch, 2009), while likening the global dissemination of environmental standards to a convergence of institutional arrangements adopted nationally and locally (Dumoulin & Saurruger, 2010). Here, the levels of action would find their analytical place. However, it is advisable to make a clear distinction between the two phenomena (Knill, 2005): When this school of thought looks at the international level, it is first through model adoption aspects (e.g. via the pressure of conditionalities), paying scant attention to the bottom-up logics of strategic activation and instrumentalization of constraints from above. Therefore, overall, while these approaches are not without merits in understanding the processes specific to the levels they study, attempts at junctions are rare.

Yet the study of environmental conflicts shows, on the one hand, that international management models are not adopted ready to use, but rather translated in each national and/or territorial context. Even though they struggle to convincingly grasp these multi-level dynamics such as the highly descriptive article by Solanes (2013) on Chile and Peru, some articles describe the influence of international models over Domestic Environmental Policies (Berstein & Cashore, 2012), along with the interactions between levels (Busch, Jurgens & Tews, 2005; Rabe 2007; Kastens & Newig, 2007; De Deurwaerdere, 2010). The study of environmental conflicts also shows that the idea of a multi-level regulation of water conflicts helps in understanding the effects of international expertise on sector-based and national public policies: the establishment of international water expertise contributes to the introduction of new ways of regulating environmental problems and these have repercussions for the political management of unequal access to water and its service, at national and local levels. During environmental conflicts, the social movements do not seem to be fully disconnected from the spheres of power. It is not merely a question of insertion in some alter-globalist networks, but also the accumulation, at the international level, of political resources that can be reused within national spaces of power (ministries, regulatory bodies, etc.). Thus, while conventional governance approaches (Young, 1994; Castro, 2004, 2007) make internationalization the simple outcome of creating horizontal networks outside the sphere of the State, national spaces of power constitute an essential dimension of these processes (Dezalay, 2007). How does analysis not consider the national technical groups – civil engineers in particular (Barraqué, 2017) –, and their social and political power?

Considering the apparent contradiction between the heterogeneity of public action and the relative uniformity of spaces of power and coalized action

For the last few years, water management policies have been based on new legitimacies. This finding is recurrent in the literature on policy process in general and environmental policies in particular. Nevertheless, the proliferation of relevant protagonists of the water sector should not give the impression of an all-round opening up of policy-making. The research project starts from the hypothesis that the preference, as economists would say, in public policy is a collective construction, referring here to various literatures (Advocacy Coalition Framework, policy networks, and epistemic communities, etc.). There would, therefore, seem to be an apparent contradiction between the heterogeneity of the relevant protagonists and their grouping within some coalized spaces of power that give rise to public policy preferences.

Incidentally, these coalitions are based upon porosity between sectors, political powers, interests, organizations, logics and incongruous levels of action, as shown by

numerous examples drawn from environmental issues. The environmental conflict situations in the Andean, Brazilian and central Americas bring out, for example, the veritable porosity of the links between political power and social movements, a situation which seems relatively different from that in the United States (Switzer, 1997). The connections between the internationalization of environmental activism and the national spheres of power have already been studied in relation to the conflicts caused by the defense of tropical forests or of protected areas for example (Barbosa, 2003; Dumoulin, 2005). In this perspective, in the name of compensation for the elites, enabling access to positions of power for agents endowed with characteristics very similar to those of the former elites but who, by passing through environmental movements, take on a brand new political innocence, is doubtless the paradox of the current leftist governments in Latin America. For example, in Mexico, the challenging of privatization policies and the right to water movement are championed at national level by academics mostly belonging to the two largest and most prestigious universities in the country (UAM and UNAM) and having mostly studied abroad (primarily in Europe and the United States), and by local representatives of US or Canadian international NGOs. The incorporation of the right to water in the Mexican Constitution in September 2011 and the citizens proposal for a new general water law in March 2012, drafted by a collective of over 200 academics and 90 NGOs, suggests the emergence of a national water coalition firmly integrated to the international scene. Its finality is seeking to establish the right to water as a new universal advocacy and policy network, and it has thereby modified the national legal and institutional framework of water management. Another example is in the field of environmental policy, with the recognition of indigenous rights that is frequently associated with them, and it is very often that these same people have passed from one responsibility, one organization level, to another since the 1990s (Conaghan et al., 1990; Dowie, 1995; Weyland, 2004).

Water management by multi-level coalitions

Coalitions as relational systems: associations and social spreads

The final challenge in the analysis of urban water management is therefore to effectively take into account this apparent paradox: on the one hand, the increasing heterogeneity of the multiple levels of water management and, on the other hand, the porous logic of coalized spaces of power. In order to analyse policy-making, it is thus possible to focus on negotiations and learning between the relevant institutions (governance), or to concentrate on the strategies of the different protagonists of the water sector and the inclusion of their actions on the agenda (Hill, 2012). The choice in this book is to follow another perspective

which emphasizes the logic of network making that guides and influences public policies, and the oppositions that can arise from the creation of new associations and alliances. This represents a group approach to policy-making, but also to the struggles over the water services, which become the central piece in the analysis. These struggles take several forms: those between the multiple protagonists and their interests and rationalities (in this sense, the conflicts are part of policy making); those between the coalitions formed around public policy issues; those between the levels of action, and those within the coalized spaces. The conflicts and struggles can be seen in the oppositions between coalitions competing on the same issue/sub-issue, as suggested by the ACF model (Sabatier & Jenkins-Smith, 1993), and in the relational structures within each coalition, which here is akin to the structural approach of networks (Lazega, 2007).

Multi-level policy coalitions are groups, usually informal ones (Marsh & Smith, 2000; Massardier, 2006; Considine, Lewis & Alexander, 2009), which follow a pattern. They can be classified as those groups which are composed of multiple action logics, be it of elected representatives, technocratic experts and consultants, of IO and NGO funding agencies, or representatives of agricultural or industrial economic interests, and of activists (ecologists, fishermen, sometimes producer communities, etc.). Other groups are structured by configurational regularities visible through the distribution of social capital, power, and domination, through the relational structures of the coalition as revealed by centrality and density indices of the network analysis, which guide policy making and policy implementation: a causal connection exists between the structure of the dominant coalition and the outputs and outcomes of the policy in question (Sandstrom & Carlsson, 2008). Or, in other words, the content of a policy is governed by the structure of the coalition that imposes its preference on the other coalitions, which are multi-level ones (Bache & Flinders, 2004; Lazega, Jourdana & Mounier, 2007; Dumoulin, 2010). The assumption is that water management systems and their instruments (commissioning contracts, water pricing, catchment installations, etc.) are issues that crystallize conflicts and give rise to coalitions around preferences relative to the policies implemented (Sabatier & Jenkins-Smith, 1993; Boscarino, 2009; Marsh & Smith, 2000). These issues are recurrent (a service delegation contract mobilizes during its negotiation and signature) and evolve in line with technical, political and social temporalities, but also with other issues such as climate aspect, urbanization, etc.

The multi-level coalitions concept also implies on a structural analysis of public policy that does not only consider interactions between undefined "actors" alone, as network analyses usually do, but re-places the struggles for water into a relational space, which goes beyond the order of interactions and where the protagonists are positioned in a differential manner (Bourdieu & Wacquant, 1992). For example, if the policy coalitions come from multiple and incongruous organizations, those

organizations remain one of the explanatory variables of the selection on entry and of the internal structure of those coalitions. The same logic applies for the social characteristics of the individuals (training, titles, legitimacy, etc.) and their social resources accumulated over their professional and political trajectories (ability to drum up funding or support, to provide information, technical or social expertise, etc.). What brings together a coalition is important, but so is what differentiates its members socially.

Coalitions arise from the mobilization of social players by a policy issue

The solidarity within these groups, which are usually informal, mostly finds its rationale in the policy issues that generate mobilizations: price of water in a town, new catchment, new water service delegation contract, sanitation of a district, etc. Granted, this assumption is not new in public policy analysis: iron triangles, public policy communities, neo-corporatist partial regimes, and other networks have already shown its relevance. These types of protest around policy issues have several consequences.

The first is that mobilizations in these coalitions are very piecemeal and come from very diverse social spaces, sectors or organizations (Massardier, 2006). In other words, the group approach cannot be content with explanations through public actors and their attributes alone (law and sanctions) or those where civil society alone and its actors or even pressure groups hold primacy over policy-making. Such is the case with coalitions. The second consequence is that these groups are non organizational in the sense that the relations between the individuals making up the coalitions go beyond the framework, norms and interests of organizations to which they nonetheless belong. Moreover, today, this is a trait shared by all the literature on public policy networks. Indeed, the first works on coalized policy spaces (initially based on the elitist theory) explained that public policies are negotiated in spaces of informal interdependence, which transcend bureaucratic organizations and interest groups (Lowi, 1969; Mc Farland, 1987).

Coalitions are collective preference systems about policy issues

Some analysts of coalitions say that these can bring out the instrumental rationality of temporarily allied actors[2] who primarily seek to structure power to achieve the primacy thresholds defined by the nature of the issue and by the rules of the game (Lemieux, 1998). But, on the contrary, far from self-interest maximization and game theory, the Advocacy Coalitions Framework (ACF), which arose from the

2 This does not mean that strategist approaches (notably agenda setting) are not operational but only that explanatory primacy is accorded here to the group approach to policy making.

observation of water management systems in the United States (Sabatier, 1988) explains policy chance through an alternation of the dominance of group backing advocacy (coalition). According to this cognitive approach, shared beliefs permit the coalitions to be built and effective. ACF defines coalitions by the following elements: an advocacy (economists would say a preference) cements the members of the coalition together in the long term; the actors share a common vision of the public policy that is mobilizing them, a vision that only changes on the periphery. Thus, work on advocacy coalitions (Sabatier & Jenkin-Smith, 1993), on public policy communities (Marsh & Rhodes, 1995) or on epistemic communities (Haas, 1993), makes it possible to qualify coalitions as groups of actors who share a minimal vision of the policy problem arising and of the solutions to be applied to it, affinities of normative beliefs (Lemieux, 1998). Unlike rational choice and public choice approaches, these approaches have the merits of placing the emphasis on group dynamics, explaining policy choices by the shared interests and ideas of these groups.

However, the coalition concept developed in this book complicates the one used by the ACF. It takes up the basic postulate whereby the definition of preferences in public policy is not a matter of the self-maximizer but of a group logic, of coalized action. Policy-making is operated by protagonists of the water sector, working together and mobilized by an issue (negotiation of a public service delegation contract, decision to open a new catchment, etc.). A certain number of other ACF postulates are worth being, if not reconsidered, given that the cause is not necessarily what defines a coalition, since a power-holding group may change its world vision while strengthening its coherence around the power it holds. The time span of a coalition mobilization is not necessarily long. These groups are therefore characterized by mobilizations around issues that are either short-lived, (a public policy system, as highlighted by Lemieux) or long-term (defense of a sector or a cause for decades, as found in the work by Sabatier). Lastly, a system of coalition opposition is not necessarily head-on, in that bridges may exist between coalitions. These groups and their type of solidarity are the outcome of both, the sharing of common ideas on an issue, the sharing of interests around that issue, the social division of labour, and the specialization (expertise, etc.) in the issue in question. That is why the concept of coalitions used in the collective researches presented in this book includes social characteristics of members that are structuring coalitions.

Coalitions between the territorialisation and internationalization of conflicts and of policy making

Coalitions cannot be just defined by the beliefs and position of their members as might be suggested by the ACF (Weible, 2005). Moreover, their work remains

attached to the description of territorialized dynamics. Neither is it a matter of self-governing irrigation systems as studied by Ostrom (1990), but rather of territorialized systems embedded in national and international processes. The analysis of a water management system confined to the territory indeed appears to be restrictive, in view of what can be learnt from the literature on the internationalization of environmental policy. It is more relevant to expand the understanding of territorial water management to other levels (Daern and al., 2006). Whether it be a matter of public policy transfers (Marsh & Dolowitz, 2000), international circulation of public policy frameworks (river basin management, integrated management, participation) or the issuing of transnational injunctions (Stone, 2008), each of the levels brings into play specific skills and specific strategies. A level is not defined by its institutions alone (public or private), but also by interactions specific to that level – for example, lobbying European institutions at European level, policy-making specific to the national level and to its political, institutional and budgetary order and norms. Each level is therefore a specific space of action, which does not of course prevent struggles between levels for the management of a policy, or even the fact of calling upon the resources of a given level to act within another (international expertise in a local struggle for example). Secondly, a level must be defined by changes of scale: there are multi-positions within these multiple levels of action, systems of relations between the levels (formal relations defined by texts in federal systems, the taking over of public policies by new levels, etc.).

Conclusion: how to operationalize the multi-level policy coalitions approach

This approach has methodological implications. Firstly, those at the analysis level, as the sub-issue is considered as a whole, and not only the coalitions it mobilizes: context, policy-making, instruments, social mobilisations and, of course, the coalitions competing to control them and to define water policy. Thus, the enquiry must make it possible to contextualize coalitions within policy-making as a whole and the conflicts at work. It must be possible to gather sufficiently detailed information on the conflict being studied (issues, local context), on the political system (political parties, structure of political game, contentiousness) and, lastly, on policy-making (institutional players, organizations and social agents involved, tools and their objectives, agenda setting processes).

Secondly, this approach has implications for the level of data gathering on the coalitions, which is bound to be very micro. The challenge is, therefore, to strike a compromise between a research ideal and its feasibility, with the need to reduce the perimeter of the tools and protagonists. For instance, given the focus

on water management struggles, the purpose of the survey and analysis must be, in each fieldwork, that of a water management sub-issue (negotiation of a distribution contract, installation of water meters, or a new catchment, etc.), and especially to recompose the set of sub-coalitions mobilized by that sub-issue. There are methodological implications in terms of gathering and processing information on coalitions: the second stage of the survey consists in both gathering data using an interview grid and processing them quantitatively and qualitatively *(Cf. Annex 1; p. 40)*. There are four types of criteria for determining the questions.

- The first type of criteria concerns representations and preferences in terms of conflicts and public policies (good and bad policies, solutions, instruments, etc.). It is a matter of recomposing the systems of oppositions between the social and political representations of the members of coalitions through a qualitative analysis of their discourses.
- The second type of criteria concerns representations of the coalitions: what are the coalitions opposed on? Who backs which policy in which coalition? From that, a system of each actor's beliefs can be identified. It is composed by three elements: (i) the core values, a central nucleus of normative and ontological axioms that base the person's philosophy; (ii) a set of political positions and strategies in order to assert these axioms within the subsystem; (3) a set of secondary elements composed of instrumental decisions and research to implement policy positions within a specific policy area (Sabatier & Jenkins, 1993).
- The third type of criteria concerns the system of links (interactions, interrelations) and solidarity of the coalition to which the interviewed stakeholder engages: which relations with which actors in the coalition? Which oppositions with whom? What are the configurational regularities within the coalition? Network-related characteristics of the water protagonists, such as relational capital (Bourdieu, 1980), communities (Newman M. E. J., 2006) and p-cores (Batagelj & Zaveršnik, 2011), authorities and hubs (Kleinberg, 1998), brokerage roles (Gould, R. & Fernandez, R., 1989), structural holes and constraints (Burt, 1992), can be determined thanks to quantified data: centrality indices, graph metrics, and measurement of interactions, i.e. who exchanges what information or expertise with each other? (Sanstrom & Carlsson, 2008; Considine, Lewis & Alexander, 2009). This system of interactions combined with the system of beliefs then allows elaborating a typology of the links, according to Weible (2005), into six classes *(Cf. Box 1, p 31)*.
- The fourth and last type of criteria for the gathered data concerns the attributes of the interviewees, from the most classic (age, gender, training) to the least classic (political, professional trajectories, influence, resources, notably that of the ability to pass from one level to another).

1 - Six classes of links

(i) A link of "pure coalition" connects two actors who are not necessarily institutionally related but who share the same core values and work together to transform their views into public policy.
(ii) An "interested coordination" occurs between two actors not sharing the same views (core values) but sharing any other element (secondary elements) and exchanging resources (money, staff or services), leading them to coordinate each other for a short moment.
(iii) A "mandatory coordination" links two actors sharing the same institutional space and having to coordinate their efforts even if they don't have the same positions. They are forced to take decisions together.
(iv) A link of "hierarchical coordination" is based on obedience.
(v) An "exchange of information" occurs between two actors that may or may not share the same values or secondary elements but who are going to be together for a moment because one of them asks information from the second one.
(vi) A link of "conflict" connects two actors having opposed core values and competing to impose their views as being the public policy which is needed.

Finally, through an ultimate overall synthesis of all previously described groups of criteria, the methodology consists in recomposing the social dynamics at work (grouping, exchanges of resources, oppositions, position taking), based on the protagonists of the water sector, their interactions, trajectories, resources, representations and their strategies, in order to reconstitute the formation of the effective coalitions around urban water and the conflicts it generates. It is therefore a matter of understanding who holds the power, i.e. the ability to integrate the decision-making spaces of the coalitions, to deal with the policy challenges brought about by the effects of climate change.

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The case studies of the Bluegrass project.

Annex 1 • Methodological grid

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Sub-variable	Information sought	Criteria	Sub-criteria
	Note: This spreadsheet presents informations that need to be collected. Specific questions/ways to collect these informations are left to each interviewer.		
Investigation field	Where the conflict takes place		Name of the city/area
			Country
VARIABLE 1 - Contextualization of the current situation/conflict			
	PHASE 1. Fine description of facts/events/Policy instruments/relevant actors and institutions (that can be used to fill in the next parts)		
	Mapping of relevant actors Mapping of policy processes and instruments		
General features of the water "government"	Who governs	Relevant actors and institutions, salience	
	What type of policy process? Fine description	Story of policy process	Agenda Setting/policy entrepreneurs/policy windows…
	Type and scope of participation	According to the actors, how they participate in the public action	Electoral/Contencious/Direct in arenas/Neo Corporatism/In powerfull coalitions
	Which principles/norms/ instruments? Fine description	Relevant policy instruments	Laws/contracts/price/technical tools…
History of the current conflict/ challenge at hand	Periodization Contextualization	Produce one temporal frieze of the main events (laws, decisions, instruments, demonstrations…)	Main dates: starting point, turning points, main evolutions, oppositions…
General understanding of the conflict	Degree of confliction	Intensity	Description of demonstrations, meetings, relations with other actors…
General understanding of the conflict	Degree of publicity of the conflict	Visibility	Review in press, perceptions of actors…
	PHASE 2. Interviews		
Perception of conflictuality	Does (and if yes, how and to what extent) the interviewee perceive the situation as a contentious one?	Description of the conflict by the interviewee	Level of perceived conflictuality

Sub-variable	Information sought	Criteria	Sub-criteria
Perception of a system of conflict by the interviewee	To what extent does the interviewee consider that actors involved hold consistent preferences on the issue?	Description of the situation by the interviewee	Level of perceived "consistency" of actors positions in the field/ configuration
Perception of the object/ stakes of the conflict/ challenges	On what basis does the interviewee define the current situation-conflict?		
		Perception of socioeconomic vulnerabilities by the interviewee	**Socioeconomic vulnerabilities**
			Solvency
			Lack of expertise
		Perception of socioeconomic vulnerabilities by the interviewee	Type of access for the poor
			Social inequalities
		Perception of environmental/health-related vulnerabilities	**Environmental/health-related vulnerabilities**
			Quantity problems
			Biodiversity problems
			Impact of climate change
		To what extent does the interviewee consider that there is a problem of articulation between sectors?	**Articulation between sectors**
			Drinking water VS irrigation?
			Industrial VS irrigation?
			Drinking water VS industrial?
		To what extent does the interviewee consider that there is a problem of articulation between sectors?	Environmental protection VS other uses?
		To what extent does the interviewee consider that there is a problem of articulation between territories?	**Articulation between territories**
			Upstream VS downstream?
			Urban VS rural?
		To what extent does the interviewee consider that there is a problem of articulation between uses?	**Articulation between uses**
			Tightly linked VS. highly inefficient and decentralized

Sub-variable	Information sought	Criteria	Sub-criteria
Perception of the object/ stakes of the conflict/ challenges		To what extent does the interviewee consider that there are financing and/or price-related problems?	**Financing and/or price-related problems**
			Is the current level of price subsidy a problem?
			Is the current level of price subsidy sustainable?
		Perception by the interviewee of governance of the issue	**Governance of the issue**
			Good governance
			Lack of inclusion of some key actors?
			Problem of institutional fragmentation/dispersion?
			Blocking due to some conflict?
			Lack of legitimacy of the current arrangement?
VARIABLE 2 - Interviewee's preferences			
	What are the interviewee's preferences in terms of policy content and policy instruments?	Criteria have to be tailored to each case study	
Policy values (~deep core)		Policy principles/general priorities	Health protection
			Environmental protection
			More water mobilization for use
			Self-financing
			Other
			If others policy principles/ general priorities, specify
		Policy content/substance	Full-cost recovery
			More stringent rules for large users/heavy polluters
			Larger role for Basin committees
			Larger participation from social organizations
			Other
			If other Policy content/substance, specify

Sub-variable	Information sought	Criteria	Sub-criteria
Policy instruments		Instrument which might be relevant to resolve the problem	Water charges
			Public-private partnership
			Increasing block tariffs
			Aquifer contract
			Other
			If other instrument, specify
			Fine description of the instrument
Most legitimate actors to formulate and implement policy		Instrument which might be relevant to resolve the problem	Federal governement
			Watershed committes/agencies
			State governments
			Municipalities
			Private sector
			Ejido
			Users' association
			Civil society organizations/NGOs
			Other
			If other institution, specify
			Fine description of the institution
VARIABLE 3 - Composition and functioning of the policy coalition			
	How does the policy coalition work?		
Interpersonal ties	With whom and how does the interviewee interact?		List of actors named by the interviewee (max. 7)
		The four following criteria have to be evaluated FOR EACH ACTOR NAMED BY THE INTERVIEWEE	
		Unit of measure of the link	Exchange of informations, advice, expertise, collaboration…
		Nature of the tie	Meetings, e-mails…, formality/ informality
		Strength of the tie	Frequency of interactions
			Time elapsed since they know each other
			Mutual confiding
			Exchange of favors
		Degree of institutionalization	Institutional tie
			Political tie
			Hierarchical tie
			Strictly personal tie
Outcomes - common project	Does the actor held or had hold a specific project/policy instrument/policy outcome?		
		Nature of the outcome	Legislation
			Policy instrument

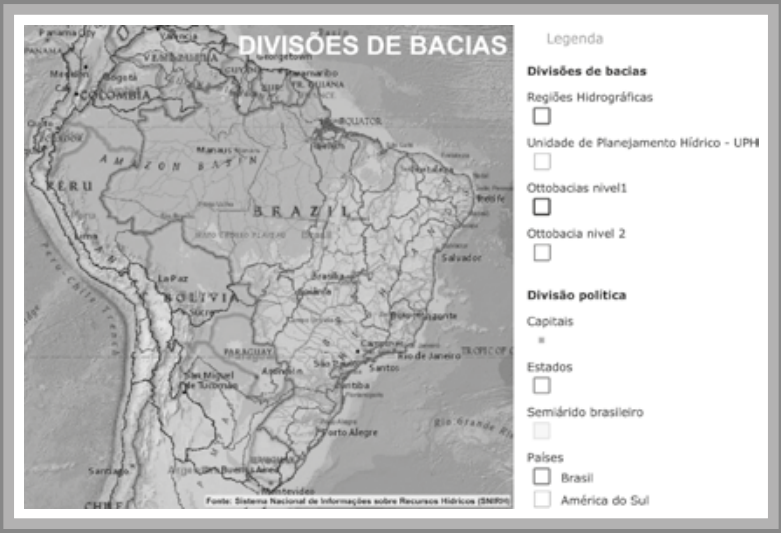
Sub-variable	Information sought	Criteria	Sub-criteria
Outcomes - common project		Nature of the outcome	Lobbying
			New institution(s)
			New social practices
			New claim(s)
			New leadership
			Other
			If other nature of outcome, specify
			Fine description of project, policy outcome, or policy instrument by the interviewee
	For the interviewee, what are the more relevant resources in the coalition		
		Nature of the resources	Expert informations
			Activist modalities of action
			Personal relations
			Other
			If other nature of the resources, specify
			Fine description of resources by the interviewee
Opposition in policy process		Oppositions	Against a specific organization?
			Against a specific actor
VARIABLE 4 - Social characteristics			
	What are the social characteristics of the interviewee?		
Identity		Gender	
		Nationality	Nationality
		Birth place	Birth place
			Capital city or other?
		Place of residence	Place of residence
			Center place or peripherical?
			Capital city or other?
			Same place where the conflict takes place?
		Social origins	Father's occupation
			Mother's occupation
			Parents' diplomas
			Parents' political evolvement
			Ethnic affiliation

Sub-variable	Information sought	Criteria	Sub-criteria
Educational background		Spoken language	Number
			Which languages?
		Subject of the studies	Hydrology - water engineering
			Agricultural engineering
			Natural sciences
			Economics
			Management
			Social sciences
Educational background		Subject of the studies	Development
			Technical Education
			Other subject of studies
			If other subject of studies, specify
			Description of educational background. The following sub-criteria have to be evaluated FOR EACH SUBJECT OF STUDY QUOTED BY THE INTERVIEWEE
		Level of Study	Level of Study
		Study abroad (or part of it)	Study abroad (or part of it)
Professional career			Description of professional career (max. 5 activities). The following sub-criteria have to be evaluated FOR EACH ACTIVITY QUOTED BY THE INTERVIEWEE
			Past or present activity?
			Description of the activity
		Level of activity	Level of activity
			If other level of activity, specify
		Position	Position
		Participation in the framework of this activity to events linked to water range	Yes/No
			Level of participation
			If other, specify
NGO			Description of NGOs (max. 5 NGOs). The following sub-criteria have to be evaluated FOR EACH NGO QUOTED BY THE INTERVIEWEE
		Member of a NGO	Past or present membership?
			Name of the NGO

Sub-variable	Information sought	Criteria	Sub-criteria
NGO		Level of activity of the NGO	Level of activity of the NGO
			If other level of activity of the NGO, specify
		Position	Position
Political involvement & activist commitment		Political position	Right - Left
			Environmentalist
			"Economic growth" advocate
			"Agricultural development" advocate
			"Right to water" advocate
		Actually member of a party	Yes/No
			Have you been member of a party?
			Name of the party
			Formal responsibilities within the party
			Official representation of the party
		Actually member of a trade union	Yes/No
			Name of the trade union
			Formal responsibilities within the union
		Actually member of a trade union	Official representation of the union
		Member of association/society	Description of associations (max. 5 associations). The following sub-criteria have to be evaluated FOR EACH ASSOCIATION QUOTED BY THE INTERVIEWEE
			Past or present membership?
			Name of the association
			Formal responsibilities within the association
			Official representation of the association
			International association

Sub-variable	Information sought	Criteria	Sub-criteria
Political involvement & activist commitment		Actually member of a social movement	Yes/ No
			Name of the social movement
			Formal responsibilities within the social movement
			Official representation of the social movement
		Level of most of his actual militant activity/ activism	Level of most of actual militant activity/activism
			If other level, specify
		Level of participation in the framework of his actual militant activity/ activism to events related to water	Level of participation in the framework of actual militant activity/activism to events related to water
		Level of participation in the framework of his actual militant activity/ activism to events related to water	If other level, specify
		Level of most of his past militant activity/activism	Level of most of past militant activity/activism
			If other level, specify
		Detailed activist career	Activist career (party, trade union, civil society…)
	What are the expertise, social capital and accesibility to resources for action and decision making of the interviewee?		
Expertise		Type of expertise	Technical
			Laws
			Other expertise
			If other expertise, specify
Influence and Decision Making		Capacity of Influence et Decision making	**The following sub-criteria have to be evaluated FOR EACH CONTEXT: (1) IN THE CONFLICT, (2) IN THE COALITION, (3) IN THE PROPOSED SOLUTION**
			Key institutional and organizational position
			Combination of technical and political capacities
			Permanence and stability in the theme
			History of past success in the water sector
			Social mobilization capacity
			No dissenting voice among the close people

Sub-variable	Information sought	Criteria	Sub-criteria
Influence and Decision Making		Capacity of Influence et Decision making	Ability to liaise with other sectors out of the water
			Different types of expertise (laws, technical, etc. and not just academic)
			Access to finance: the ability to obtain funds
			Access to international influence
			Other resources
			If other resources, specify



The hydric system of Brazil.

Annex 2 • Water Policy and Technical Systems in Brazil

Estela Macedo Alves, Natalia Dias Tadeu,
Izabela P. de O. Santos and Ana Claudia Sanches-Batista

This historical description of the water and sewage sanitation management and supply services aims at presenting the transition from a centralized political model of hydric management systems to a decentralized and participative model. Water resources and sanitation have many interaction points in the history of Brazilian public management; however, the integration between them features in recent public policies. This connection among many water uses was broadened due to debates about environment and natural resources in world forums organized by international organs since the last decades of the 20th century. Many authors address the urgency on issuing water integrative policies to meet human and ecosystems' needs, rather than just deciding based on commodities (Calder, 1999; Barlow, 2003).

In the beginning of the 20th century, the solutions for residual water in Brazilian cities were given in a particular form, overall, these solutions were quite simple and citizens themselves were in charge of them (Bonduki, 2004). Sanitation was not a public matter, but water resources were already in the federal government agenda. From 1930 to 1948, water resources administration in Brazil followed the so-called bureaucratic model, which aimed at following the legislation and sectorial management. Every time a new conflict would come up, a new law or rule was created, and these laws and rules were opposite to each other (Borsoi & Torres, 1997). Water policy was designed in a centralized and fragmented way, since power generation, agricultural and sanitation companies, among others (all directly related to the amount and quality of hydric resources), used to plan their own actions. The state and federal governments defined the hydric policy without the participation of municipal governments, as well as civil society (Abers, 2005; Campos & Fracanlanza, 2010). The "Water Code" (*Código de* Águas – Decree nº 24.643, from July 10th, 1934) defined the use and management of hydric resources; it was based on the federal administration supremacy to handle hydric matters (Campos, 2007). The Code was issued between 1934 and 1961, water management was then carried by the Ministry of Agriculture; subsequently, the responsibility was transferred to the Ministry of Mines and Energy (Campos, 2007; Campos & Fracalanza, 2010).

Sanitation was regulated by the National Sanitation Plan (Plano Nacional de Saneamento – PLANASA), which was launched in 1971 by the Ministry of Inlands (MINTER). According to this plan, each state in the country should create its State Basic Sanitation Company to get the resources and implement services. Accordingly, SABESP (*Companhia de Saneamento Básico o Estado de São Paulo* – São Paulo Basic Sanitation Company) was created in 1973 (Campos, 2007). It aimed at structuring water supply and collection services, as well as sewage collection and treatment in municipalities. The federal government was responsible for financing sanitation systems, deciding on taxation policies and for defining the general guidelines to be put in place in the states, which should run the services in the counties through state companies (Cunha et al., 2006). Table 1 (p. 54) presents a compilation and brief summary about the organizations that comprise the management system of hydric resources and sanitation in Brazil.

Brazilian population in the cities became bigger than the rural population in the 1970s. Although, in São Paulo State, urban population was bigger than the rural one since the 1960s: 62.8% of the population was then urban, and it increased to 80.4% in the following decade. Yet, between 1960 and 1970 in São Paulo, the sanitation sector went through many restructurings, through the creation of new institutions of metropolitan actions and resource-management funds, among others; from which we highlight the State Scientific and Technological Development Center (*Centro Estadual de Desenvolvimento Científico e Tecnológico*) that was supposed to support basic sanitation and pollution control programs. Next, these institutions became the Basic Sanitation Technological Center (*Centro Tecnológico de Saneamento Básico)*, nowadays known as São Paulo State Environmental Company (*Companhia Ambiental do Estado de São Paulo* - CETESB), whose function is to control, supervise, monitor and license pollution-generating activities to preserve and recover the quality of water, air and soil (Neto, 2013).

From 1970 until 1988, the management was then based on the so-called economic-financial model: public power used economic and financial instruments to promote development (Borsoi & Torres, 1997). On the other hand, sanitation emerged as a worrisome state issue, since cities were growing fast without the required infrastructure. At this time, the Hydrographic Basins Superintendencies (*Superintendências de Bacias Hidrográficas*) was still running, having multi-sectorial goals, but linked to a single ministry. Despite the great planning possibilities in the hydrographic basins territories, the existing conflicts in the bureaucratic model were not solved (Campos & Fracalanza, 2010).

Throughout the 1970s, studies on the multiple uses of hydrographic basins were performed, as well as new demands of effluent treatment emerged. In the 1980s, power generation sector demanded more regulations and it effectively still had great influence on the water resources management in the country. Back in the 1980s, the country entered a new period, which was marked by economic crises;

however, the country registered political gains (Salles, 2009), since segments of the population started gaining visibility due to the democratization process (Dagnino, 2004a; Dagnino, 2004b; Salles, 2009). Back in 1984, the National Water and Electric Power Department (*Departamento Nacional de* Águas *e Energia Elétrica* - DNAEE) had already diagnosed the hydrographic basins, some Hydrographic Basins Committees (*Comitês de Bacias Hidrográficas* - CBHs) started emerging, and the National Environment Council (*Conselho Nacional do Meio Ambiente* - CONAMA) was launched.

The National Housing Bank (*Banco Nacional de Habitação* - BNH) that was responsible for financing sanitation through PLANASA was extinguished in 1986: it went bankrupt and left to *Caixa Econômica Federal* (a public national bank) the responsibility of coordinating and managing PLANASA (BRASIL, 1986). After that, no other policy replaced it. However, the states kept on acting through the state sanitation companies as they were set; these companies assisted approximately 83% of the population linked to the network. Other services forms, such as municipal public servers and private companies, represented approximately 17% of the assistance available (Cunha et al., 2006). It was from 1988 on, due to the 1988 Federal Constitution, that the initial conditions for implementing the systemic model of participative integration was created (Borsoi & Torres, 1997).

A new stage in water resources management emerged, namely: The Participative Integration Systemic Model, according to Borsoi and Torres (1997), this model takes into consideration social equity and environmental balance criteria for the management of water resources that come from negotiations inside the basins' planning units, the so-called CBHs. The new constitution opened the doors for the creation of participative councils, watershed committees, among other participative institutions. The 1990s were featured by the adoption of neoliberal perspectives implemented by the successive governments (Collor de Mello, Itamar Franco, Fernando Henrique Cardoso) (Salles, 2009). The National Hydric Resources Policy (*Política Nacional de Recursos Hídricos* - PNRH) was created within this context; and it was promulgated through the Federal Law nº 9.433, in January 08th, 1997. This law also made it possible to create a series of reforms in the sanitation sector, which implied on a privatization process performed through the private operators and through the involvement of the private sector through concessions (Salles, 2009). The decentralization process in the sanitation sector was intensified throughout this period and was mainly expressed through the granting authority (state or municipality). It enabled observing a larger variety of provided judicial services due to the inclusion of the private sector (Salles, 2009). The national guidelines bound project financing to sanitation construction projects suggested by local governments due to the Municipal Sanitation Plans (*Planos Municipais de Saneamento* - Brasil, 2007). However, most Brazilian counties present deficit of technician personnel, and it impairs the access to credit lines used to elaborate and set sanitation construction sites (Melo, 2011).

When it comes to the federal sphere, the general guidelines are set by the National Sanitation Plan (*Plano Nacional de Saneamento* - PLANSAB), which is coordinated by the Ministry of Cities. The activities in São Paulo State are ran by the State Basic Sanitation Policy (*Política Estadual de Saneamento Básico*), which is managed by the Hydric Resources Sanitation Bureau (*Secretaria de Saneamento e Recursos Hídricos* - SSRH), which, in its turn, counts on two coordination departments to deal with the "Hydric Resources Management" and "Basic Sanitation" topics (SSRH, 2014). However, both the State Basic Sanitation Policy, and PLANSAB itself, acknowledge the municipal autonomy to deal with the subject; once it states that counties must elaborate their Municipal Basic Sanitation Plans (*Planos Municipais de Saneamento Básico* - PMSB), which shall guide the sector.

It is worth taking into account that the aforementioned models – bureaucratic, economic-financial and systemic participative integration – are not excluding but rather overlap each other at times; not often the water management policy is participative and decentralized, such as the case of São Paulo State nowadays. The recentralization of water management policies was observed after 2014 (Fracalanza, 2016). This analysis has been corroborated by the present research, which indicates that certain political instruments still keep centralizing characteristics, such as the concentration of decision-making processes concerning sanitation in the State Company in São Paulo State.

Table 1 – National Hydric Resources and Sanitation Management System

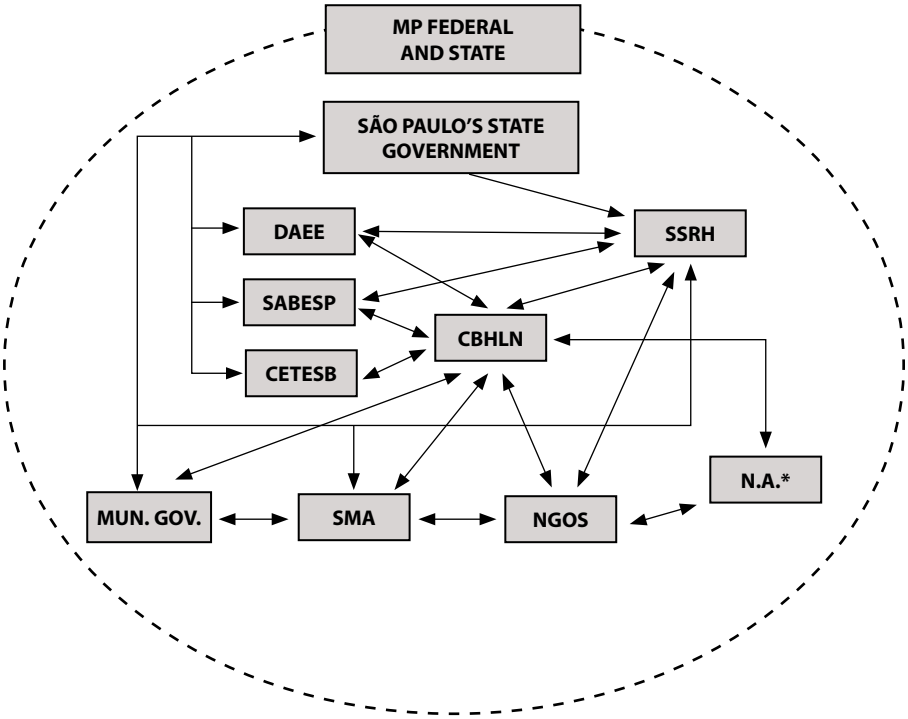
Entity	Attribution
National Hydric Resources Council (*Conselho Nacional de Recursos Hídricos* - CNRH)	The most important organ of SNGRH (Sistema Nacional de Gerenciamento de Recursos Hídricos), responsible for minimizing use conflicts (in last instance) and for subsidizing the formulation of National Hydric Resources Policies
Hydric Resources Bureau	Federal organ in charge of formulating the National Hydric Resources Policy and acting as the executive CNRH office
National Water Agency (*Agência Nacional de Águas* - ANA)	Regulates the use of hydric resources in rivers belonging to the Federal domain and coordinates SNGRH implementation throughout the entire national territory
State Hydric Resources Council (*Conselho Estadual de Recursos Hídricos* - CERH)	The most important state organ responsible for minimizing use conflicts at State scope and for subsidizing the formulation of State Hydric Resource Policies
State Hydric Resources Manager	Central organ and coordinator of the State Hydric Resources management System, which has competences similar to ANA, with emphasis on ownership and supervision of hydric resources use at State domain

Entity	Attribution
Watershed Committee (*Comitê de Bacia Hidrográfica* - CBH)	Collegiate constituted by public power, users and civil society able to approve the watershed plan, to follow its conduction, to set the collection mechanisms, and to suggest CNRH the values to be collected
Watershed Agency	Executive office of the Watershed Committees responsible for keeping the hydric balance updated when it comes to water availability, keeping users' records, operating collections, and elaborating the watershed plan

Source: Braga et al. (2008).

Figure 1 – Institutional relations of the conflict for access to water

Based on the institutions involved in this local conflict for access to water, it was possible analyzing the protagonists of the conflict. They belong to different institutions, at multi-level spheres: municipal, regional and national.



** Neighborhood Association*

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Part 1

Inequalities and water conflicts

1 The difficulties of engineering a drought

2 Explaining path dependence and blame avoidance

3 Fighting for equal infrastructures

4 Openings for public policy in the water rights

A public meeting of one of the residents of the south area of La Paz during the water shortages of 2016-2017.

THE DIFFICULTIES OF ENGINEERING A DROUGHT

Policy coalitions and the water shortages of 2016 in La Paz (Bolivia)

Claude Le Gouill & Franck Poupeau

Introduction: water shortages and political crisis

In November 2016, water distribution was cut in the majority of neighborhoods in the Zona Sur of La Paz, Bolivia's capital city. The reservoirs supplying those mostly well-off neighborhoods had reached their lowest storage levels. Since the metropolitan area is covered by several different supply systems, many parts of the city were not affected. However, for over a month, demonstrations took place in local neighborhoods that had been affected, demanding that the service be restored, a goal that had not been achieved by the emergency measures introduced by the City Hall (water tankers, etc.) and, later, by the national government. This water "crisis" was highly symbolic in Bolivia, where the issue of water had played a major role in the election of the country's first Indian president, Evo Morales, in 2005. The Cochabamba Water War of 2000, and the El Alto Water War of 2005, fought against the privatization of the water system, had international repercussions and pitched Bolivia onto the front line in the struggle against "neo-liberalism" (Hylton & Thomson, 2007; Webber, 2011). Mass protests helped Evo Morales to victory, which was largely based on his anti-imperialist, sovereign stance and his desire to ensure that the country's people regained control of their destiny, which was, and is, closely associated to mineral resources (not only water, but also gas, oil, etc.).

Over ten years after these events, the water crisis of 2016, which occurred in a specific political context, revealed new tensions in the country at various levels. For example, it was announced that the public water distribution company set up after the El Alto revolt in 2005 (Poupeau, 2008) and run by the Ministry of Environment, would become a metropolitan company whose territory was yet to be defined. At a local level, the conflict deepened between the central government of Evo Morales's Movimiento al Socialismo (MAS) party and the two main cities in the concession, La Paz and El Alto, whose mayors belonged to two opposition

parties, respectively the Sol.Bo (Soberanía y Libertad), led by Luis Revilla, and the Unión Democrática, led by Soledad Chapetón (who has close ties to Samuel Doria Medina, an entrepreneur whose political organization has always been opposed to Morales' government). At the national level, there had been increasing criticism, since the TIPNIS conflict in 2011,[1] on the government's mining policy and its apparent incompatibility with the promotion of an enchanted vision of "Indianidad", summed up in the phrase *vivir bien* ("the good life") and in the cult of Pachamama (Poupeau, 2013). It should also be noted that the government was faced with many corruption scandals and that, for the first time since 2005, it had begun to show signs of political weakness, notably by losing the referendum held in 2016 concerning a change in the constitution that would have enabled President Morales to stand for another term.

The aim of this chapter is to examine how the water shortages of 2016 led to realignments in coalitions, and to analyze how those realignments impacted the development and implementation of water policy in the La Paz-El Alto metropolitan area. Based on documents collected during the period in which the water supply was curtailed and on 16 interviews conducted with representatives of the main organizations involved in managing the crisis *(Cf. Table 1; p. 63),* the article first describes the various narratives outlining the conflict over access to water, the eminently political dimension which sometimes overdetermined other issues, both in terms of an analysis of the situation and of the implementation of emergency measures. It then discusses the way in which measures designed to manage the crisis were implemented in the areas most affected by water shortages; the water crisis was inseparably a political one, the main characteristic of which was to reveal alliances and divisions that a more global view of the situation would have been incapable of grasping. Delivering an analysis of networks of collaboration and conflict in the neighborhoods particularly affected by water shortages, our survey is based on an interpretative model describing the emergence of a dominant coalition between the government and the water distribution company. It shows that this coalition was articulated around the consolidation of institutional forms of management of the water distribution service based on engineering expertise implemented with a view to boosting water supply rather than improving ways in which the resource is used.

1 The conflict pitted Evo Morales's government against the indigenous populations of the Isiboro Securé Indigenous Territory and National Park (TIPNIS) over the construction of a road through the territory, which had been declared a national park in 1964, and was the first indigenous territory recognized by the state (1990). The demonstrations organized by indigenous people against the road project and the repression associated with it had a substantial impact on political life in Bolivia, causing tensions between numerous social groups (mainly indigenous and environmentalist organizations) and government policy.

Table 1 - List of interviewees

1	Member of the Reaccion Climatica NGO
2	President of FEJUVE La Paz
3	Researchers at the IRD (Glaciologist, Biochemist)
4	Urban planning technician at EPSAS
5	President of the District 19 (Complementacion El Pedregal) *Junta Vecinal*
6	President of FEJUVE SUR La Paz , El Pedregal, District 19
7	President of the *Junta Vecinal*, Bella Vista Sector, District 21 (Alto Obrajes)
8	Control Social, District 21 (Zona Sur)
9	Independent journalist specialized in environmental issues
10	President of the *Junta Vecinal*, Sector D, District 21 (Alto Obrajes)
11	Journalist at *Pagina Siete* (opposition)
12	Director of EPSAS (2007-2011), (from 2016)
13	Engineer, EPSAS
14	Water Directorate, Ministry of the Environment
15	Civil Engineer, Ministry of the Environment
16	Director of EPSAS (2013-2014)
17	Supervisor at EPSAS
18	Civil Engineer, La Paz City Hall
19	President of the *Junta Vecinal* of District 13 (Villa Fatima)

Table 2 - Glossary of institutions

Institutions	Functions
MMAyA (Ministerio de Medio Ambiente y Agua),	Responsible for managing EPSAS in La Paz until the implementation of the metropolitanization process.
EPSAS (Entidad Prestadora de Servicios de Agua Potable y Alcantarillado Sanitario)	Local company responsible for water and sanitation.
AAPS (Fiscalización y Control Social en Agua Potable y Saneamiento)	Authority responsible for overseeing and supervising activities and budgets of legal persons in the water sector (public, private, community-based, cooperative).
Control Social	Public authority responsible for representing the Districts at the City Hall.
Community Association	Organization including all the *Juntas Vecinales* in a particular District.
FEJUVE La Paz	Organization including all the *Juntas Vecinales* of the Districts of La Paz (except those in the Zona Sur).
FEJUVE Sur	Organization including all the *Juntas Vecinales* in the Districts of the Zona Sur.
IRD	Institut de Recherche et de Développement ("French Institute of Research & Development").

A brutal, sector-based curtailment of the service: From municipal action to government intervention

Water outages in the Zona Sur were decreed by the municipal company, EPSAS (Empresa Publica Social de Agua y Saneamiento), on November 7th, 2016, before an additional wave of rationing was announced for other parts of La Paz and a number of neighborhoods in the city of El Alto. The service was only restored gradually, area by area, starting in December 2016, but it was to be limited, in some neighborhoods, to a certain number of hours in the day until February 2017.

These events should be placed in the context of water governance in Bolivia since the election of Evo Morales. In 2006, his newly elected government set up the country's first Ministry of Water, having at its head Abel Mamani, one of the most important figures in the El Alto Water War. Following the introduction of the new State Political Constitution in 2009, the Ministry of Water was incorporated into the Ministry of Environment (*Miniserio de Medio Ambiente y Agua* – MMAyA). This ministry was responsible for developing policies and norms and establishing water and sanitation mechanisms around the country. Responsibility for supervising the activities and budgets of legal persons in the water sector (public, private, communitarian, cooperative) was granted to the *Autoridad de Fiscalización y Control Social en Agua Potable y Saneamiento*. Meanwhile, responsibility for water distribution was also decentralized to departments tasked with coordinating projects, as well as, and above all, to municipalities, whose job was to fund and implement programs (with subsidies from the MMAyA). Last, at the local level, the *Entidades Prestadoras de Servicios de Agua Potable y Alcantarillado Sanitario* (EPSAs) (EPB, MMAyA, 2011) were directly responsible for water distribution and sanitation.

In La Paz, the EPSAS has been the authority responsible for managing the water network since 2007. A decree issued by Evo Morales had transformed the Aguas del Illimani consortium, set up in 1997, into a public and social enterprise (Botton, 2007). Like other public companies, the water distribution service was a figurehead for the government's transformative agenda. Indeed, the new version of the service was intended to represent a break with private management by providing "water for all" (Poupeau, 2010). However, throughout the decade preceding the 2016 water crisis, the La Paz EPSAS experienced a number of difficulties, not only in terms of changing the price policy that had been in effect since the preceding private management period, but also of developing urbanization and social aid policies designed to counter the logics of illegal construction, unfettered development, and real estate speculation dominant in unequipped zones, "non-places" of privatization and remunicipalization (Poupeau, 2009).

The fact that one of the main objectives of the EPSAS was to reduce social inequalities via the promotion of "water for all" makes it all the more surprising that the water shortages of 2016 primarily affected the neighborhoods of the

Zona Sur, considered the wealthiest in the city, traditionally hosting the residences of expatriates, senior civil servants, and a qualified "middle class,"[2] including a substantial number of journalists who provided a high degree of media coverage. The shortages in the Zona Sur can be explained referring to the territorial management approach applied in the concession of the agglomeration of La Paz and El Alto, which depends on three distinct sub-systems *(Cf. Box 1; p. 66)*. The reservoirs of the Hampaturi system were at their lowest levels due to a series of climatic factors: El Niño brought less rain in 2016, and the volume of glaciers had been diminishing for several years leading to a reduction in meltwater. In fact, the Hampaturi watershed has not been fed by a glacier since temperatures started to rise in the Andes a few decades ago (Rabatel et al., 2013), the dams simply being filled by rainwater (from October to March). Due to the decline in rainfall in 2016, the Hampaturi reservoir was far from full. In December, only one of the El Alto-La Paz metropolis' watersheds, Turi-Condoriri, was being fed, thanks to the continued existence of a number of glaciers. Then, in September, levels at the Hampaturi Dam declined dramatically, a phenomenon that could not be explained by environmental conditions alone (interview with Patrick Ginot and Gaëlle Uzu, researchers at the IRD, 10/02/2017). This sudden drop in water levels came as a surprise to most observers: "It was a shock for us; it happened overnight, no one had informed us about it" (President of *Control Social* – District 21, interview 17/02/2017).

On the same day, emergency measures were announced by both the EPSAS and City Hall. The body initially responsible for managing the crisis was the Municipal Secretariat for Integrated Risk Management (SMGIR). Several years ago, confronted by an abrupt, fragile topography (floods, landslides, etc.), the La Paz City Hall introduced a major risk policy (Hardy, 2009), even going so far as to develop a recognized "culture of resilience" approach benefiting from international aid (*Correo del Sur,* 2016). The City Hall took the initiative in terms of crisis management, with the engineer Vladimir Toro of the SMGIR working alongside the head of the EPSAS and the Ministry of Water and the Environment. The strategy was based on using groundwater to fill tanker trucks and water tanks provided for the neighborhoods most badly affected by the crisis.

Faced by the sheer scope of the crisis and the growing influence of La Paz City Hall, which declared itself willing to accept the EPSAS's transformation into a public company (*Pagina Siete*, 16/11/2016), President Evo Morales asked for "forgiveness from the city of La Paz for the water shortage." He accused the EPSAS of failing to warn the government of the drop in the levels of various reservoirs, and replaced the General Administrator of the company and the Director of the *Autoridad*

2 On the ambiguities associated with the term "middle class" in Bolivia, see: http://www.bancomundial.org/es/news/feature/2013/10/24/Bolivia-poco-a-poco-construyendo-una-nueva-clase-media.print For a more historical perspective, see Soruco Sologuren (2012).

1. The three sub-systems of the La Paz-El Alto concession

The EPSAS water distribution company collects rainwater and, occasionally, meltwater from glaciers in the municipal territories of La Paz and El Alto, and from the neighboring rural commune of Pucarani. However, the fact that the La Paz-El Alto system is divided into three sub-systems can be explained in terms of water collection, purification, storage and distribution operations. For example, water collected in Hampaturi is transported to a facility (Pampahasi) in La Paz where it is purified before being distributed via the network throughout the south-eastern part of the municipality (the Hampaturi sub-system supplies around 272,000 residents). On the other hand, water collected in Milluni is purified in the Achachicala facility. Almost all of this water is fed into the distribution network serving central La Paz. However, water can sometimes be deviated upstream to be purified and distributed at the El Alto facility (the Achachicala supplies approximately 284,000 residents). Last, water collected in Pucarini is purified in El Alto, where it enters the El Alto water distribution system, as well as the system serving the neighborhoods located on the western slopes of the city of La Paz. In El Alto, a series of 30 wells also collect water from the water table. This water is purified in the Tilata facility before being fed into the El Alto network (El Alto sub-system, 915,000 residents).

de Fiscalizacion y Control Social de Agua (AAPS) with, respectively, two former administrators of the company: Marcel Humberto Claure Quesada (2103-2014) and Victor Hugo Rico (2007-2011). A few days later, President Morales set up a crisis cabinet within the government, the *Gabinete del Agua*. The cabinet was headed by Juan Jamon Quintana, Minister of the Presidency, and included representatives from several ministries (Environment, Defense, etc.). The new directors of the EPSAS took responsibility for managing the crisis and, without abandoning the idea initially proposed by the City Hall of distributing water via tanks and tanker trucks, decided to focus their efforts on deviating water from the Palcoma River to restock the Hampaturi Dam. In addition to a local management approach based on groundwater sources suggested by the City Hall, the government undertook major engineering works, which were completed in record time. The Army, rather than municipal agents, was tasked with distributing water tankers; one of the objectives was to re-establish order and alleviate tensions between neighbors and neighborhoods during the distribution of the resource. Later, Morales symbolically and definitively took control of the crisis, first by declaring a "national state of emergency" concerning the drought (Decree DS2987) – a measure that included, among other things, a subsidy of 250,000 dollars for the rescue plan – and then

appealing to citizens to "prepare for the worst" (*La Razon Digital*, 21/11/2016); and, second, by organizing a helicopter expedition, which might, perhaps ungenerously, be seen as vaguely megalomaniacal: "Evo identifies a virgin lagoon to supply water to La Paz" (*Pagina Siete*, 23/11/2016).

The government's approach represented a turning point in that it sidelined the municipality in terms of taking emergency action. This had an impact on alliances in the neighborhoods. On the one hand, the City Hall attempted to maintain its local influence by promoting a water management system based on exploiting groundwater resources; on the other, the government granted itself overarching powers by declaring a national state of emergency. The City Hall asked the government to reimburse it for the water tanks that it had provided, while the government ramped up its support for local neighborhoods by sending in more EPSAS engineers and holding meetings with local organizations. These tensions had repercussions at two levels, namely in public debates about the water crisis, and in social organizations, where everyone tried to take advantage from their relations in order to exert control over water distribution.

Struggles over the imposition of a vision of the crisis and how it should be managed

The intervention of the state marked another stage in the management of the crisis, not only in terms of the role of the concerned institutions, but also of the political struggles for the imposition of an official vision of the crisis and, in particular, for legitimacy in managing it. From a certain point of view, the government set itself the task of not only "solving" the issue, but also of demonstrating that it was free of all responsibility, and that it would put an end to the crisis, thereby proving that, had it been informed of the problem in the first place then the crisis would never have arisen. The government also intended to demonstrate its capacity to successfully intervene in an area in which La Paz City Hall was not competent, either by providing emergency economic funds, by deploying the Army to restore order, or by calling upon the advice of "experts."

In effect, from the outset of the crisis, the government came in for a good deal of criticism. Indeed, the opposition even took the Minister of the Environment to court, prompting her to resign (*La Razón,* 18/01/2017). A lawyer by profession, she was accused of not having the required environmental expertise to prevent the crisis (*Opinión*, 18/11/2016). But it was above all the lack of competence of the EPSAS – a government-run company – that was seen as the main problem in terms of a failure to prevent the crisis. The political opposition regarded it as a "*botín politico*" ("political prize") used by the government to keep its allies happy. The revelation that 52% of its budget went on salaries (*Pagina Siete*, 16/01/2016) did nothing to

allay such suspicions. Furthermore, the distribution of responsibilities (or rivalries) between groups linked to Evo Morales (the EPSAS, the AAPS, the Ministry of Water and Environment) goes some way in explaining communication problems between various institutions.[3] During the crisis, the alleged contamination of a number of water tankers provided by the public oil company, *Yacimientos Petroliferos Fiscales Bolivianos* (YPFB), also caused concern, while the government's policy of "bombarding the clouds" to induce rainfall (an operation the government called "Sovereign Rain" in reference to its sovereignist policy) was met by an amused skepticism in the media, an attitude mirrored in the interviews conducted during our survey.

Beyond the question of the government and its management of the EPSAS public sector company, which was still run under the aegis of the Ministry of Environment, the issue of the lack of clarity concerning the way in which the competent authorities managed the water distribution system was also raised. The director of the La Paz FEJUVE ("Federation of Neighborhood Councils") – a residents' association close to City Hall – explained that she had paid a surprise visit to the dams with representatives of City Hall a few months before the crisis. The EPSAS engineers assured her that water supply was guaranteed for the next 25 years (President of the La Paz FEJUVE, interview conducted 30/02/2017). Residents in a neighborhood on the outskirts of the Zona Sur experienced problems with water supply several weeks before the crisis blew up. The engineers called to the site announced that the issue had been caused by pressure problems associated with major works in certain areas (President of the "Neigborhood Council": *Junta Vecinal* of Complementación El Pedregal, interview 8/2/2017). This lack of transparency and information was subject to a good deal of criticism on the part of local residents, who considered it much more serious than mere bad management. The economic cost of the crisis was also a point of contention, not only due to the fact that local people had to make numerous purchases (cisterns, drums, bottles, etc.), but also because of mistakes made by government agents. To make up for these costs, the government had informed residents that it would not make them pay for water they had consumed in November. It then decided to charge them anyway, but backed down in the face of criticism.

Critics also prevailed upon certain forms of international expertise to argue that the consequences of decreased rainfall associated with El Niño and of the decline in the volume of glaciers had long been known, even if it was difficult to predict the strength of these climatic phenomena. This expertise was provided

3 Since the setting up of the Ministry of Water, and its incorporation into the Ministry of the Environment in 2009, eight Ministers have succeeded one another, largely due to political tensions between those close to Evo Morales and between social organizations attempting to control this governmental sector. Most of the ministers were sociologists, which demonstrates the important role of rhetoric in this Ministry. However, after the 2016 crisis, an engineer specializing in water resources was appointed as the new Minister.

by scientists belonging to research institutions outside Bolivia and by journalists and activists from Bolivian environmentalist NGOs, whose relationship with the national government was fraught at the time of the crisis *(Cf. Box 2; bellow)*.

2. NGOs and their tribulations in Evo Morales's Bolivia

The relationship between experts, international bodies and NGOs, on the one hand, and the Morales government, on the other, has changed since the latter first came to power. While, initially, the government appeared to be the guarantor of international cooperation, the implementation of the Patriotic Agenda, and, above all, the TIPNIS conflict in 2011, undermined this useful form of collaboration. In May 2013, the Morales government expelled the United States Agency for International Development (USAID), which was accused of funding the opposition and the Santa Cruz regionalist movement. In January 2014, the Danish NGO, IBIS, was also expelled, having been accused of providing logistical support to anti-government indigenous organizations. In 2015, four other NGOs – the *Fundación Milenio,* the *Fundación Tierra,* the *Centro de Estudios para el Desarrollo Laboral y Agrario* (CEDLA) and the *Centro de Documentación e Información Bolivia* (CEDIB) –, all of which had supported Morales when he first stood for President, were publicly called to order by Vice President, García Linera. Their work was considered to run counter to a number of government policies in regard to the environment, the economy, and the rights of indigenous peoples. Their "imperialist environmentalist discourse," was allegedly designed to destabilize the government.

For the most high-profile experts,[4] the main causes of the crisis were a failure to anticipate the effects of climate change, a lack of large-scale infrastructure projects, and the failure of the government's environmental education policy.[5] Several of those experts were specialists in climate change, and some of them had taken part in international meetings in which Bolivia had promoted a new view of environmental justice at the global level. According to the journalist Miriam Jemio (independent,

4 The experts most often quoted during the interviews and in the press review were Pablo Solon (former Bolivian Ambassador to the UN, whose foundation promoted the government's theme of universal access to water at international bodies), Pablo Villegas (Centro de Documentación e Información Bolivia – CEDIB), Ricardo Calla (sociologist, Universidad de la Cordillera, La Paz), Dirk Hoffman (Instituto de las Montañas, La Paz), and Cecilia Requena (Instituto de las Montañas), a social communicator with a Master's in Management and Public Policy and a Post-Graduate degree in Socio-Environmental Education from the Latin American Faculty of La Plata.

5 On environmental education in Bolivia, see Lewandowski (2015).

interview 03/02/2017), the country became, at the international level, a symbol of the struggle against climate change by attracting numerous specialists and becoming a center of media attention after the disappearance of the Chacaltaya Glacier, considered around the world to be the first glacier to have disappeared due to climate change. For those experts, it were the contradictions between what was said abroad and what was done at home that were problematic.

The anthropic factors of the crisis were also highlighted. They included the proximity of glaciers to the city, deforestation, agriculture, mining, population increase,[6] and loss of *bofedales* (high-altitude humid zones) due to the use of sand and mud for construction purposes. The lack of supervision of and precise data about the mining industry had given rise to all kinds of speculation about its impact on the environment. The proven presence of mining cooperatives above the Incachaca dams was a source of indignation and raised numerous questions, especially in that many NGOs had severely criticized the 2014 Mining and Metallurgy Law, which, among other things, granted mining companies the right to an unlimited use of water in their concessions (Le Gouill, 2017). Unlike the leaders of social organizations and the residents of the neighborhoods, experts conducted far-reaching analyses of the causes of the crisis and suggested more technical solutions dependent on specific projects, for example the construction of an additional dam. Despite these NGOs published reflections on climate change and water issues, the recrudescence of tensions between them and the government prevented their research and projects from reaching any ministerial cabinets. "The projects never reached the government; we tried … The work we did with the government was very poor, but at other times the government did listen to us […]. Later, there was no way of contacting the government, because there was no political will to create points of contact. The government had all the information about what was happening with water since 2009, which was the year when questions about climate change received a great deal of attention. But no real effort was made to solve such problems or, above all, to prevent them from arising" (Member of the Reacción Climática NGO, interview 14/02/2017).

In the end, the main criticism was of the lack of expertise of the authorities responsible for managing the water crisis. One of the primary targets of this

6 According to official censuses, the population of the city of La Paz declined by 0.3% between 2001 and 2012. This phenomenon can be explained by the city's geographical conditions – its rough, unstable topography limits its growth – and by the increase in the population of neighboring El Alto. However, the results of the census have been criticized, being it difficult to take into account the "second homes" of many residents who own properties in rural areas and are registered there to protect their rights over their land. Furthermore, new neighborhoods were built on the outskirts without being included in either censuses (for example, Complementación el Pedregal, analyzed *infra*). Last, facilitated by a recently introduced law, the increase in the number of buildings over eight floors tall (*Los Tiempos*, 21/11/2016) seems to represent an alternative approach to finding a solution to the problems posed by the city's geography.

accusation was the Minister of Water and the Environment who, although he had traveled to Copenhagen for discussions on climate change, was reported to have spent his time discussing other projects (for example, the "Mi Agua" program)[7] largely focusing on rural areas, the government's electoral heartlands. It seems that the authorities did not take account of existing studies, particularly those on watersheds (*cuencas*), undertaken by international partners (Development Bank of Latin America – CAF; the *Plan Maestro de la Cooperación Española).* Experts from NGOs and EPSAS technicians alike insisted on the urgent need to carry out further research and define a number of potential scenarios for managing the watersheds while taking environmental and human factors into consideration and, above all, drawing up a report on economic activities (mining, agriculture) on which there was no precise data. The Plan Maestro developed by Cooperación Española provided a list of infrastructure projects to be developed as a matter of urgency. Work has not yet been started on any of those projects. While in the neighborhoods, attacks on government projects (the cable car system, etc.)[8] were seen as political manipulations fomented by the opposition, for the experts those policies were revealing of management approaches that, described as "muy grandes y muy brillantes" (Member of the Reacción Climática NGO, interview 14/02/2017), were informed more by political expediency than by a desire to further an environmentalist agenda. While the government and City Hall competed with one another to build major projects, the Hampaturi Alto reservoir had overrun by six years. Regarding water, in a similar manner additional funds had been used to increase the number of connections rather than to find new sources, which were needed to palliate the effects of climate change and meet increased demand. Government projects were also used as a weapon against La Paz City Hall in the struggle for control of the city's development and modernization programs. The consequence of this competition was to delay funding and draw attention away from water projects, several of which were scheduled for completion in 2016. Of the specialists we met, only one EPSAS technician (Planning Sector, interview 17/02/2017) mentioned the issue of the consumption habits of La Paz residents, notably regarding changes in living standards.

7 The programs Mi Agua 1, 2 and 3 are, for many observers, one of Evo Morales's government's greatest successes. Developed with a view to improving access to drinking water and developing peasant agricultural productivity via irrigation systems, these programs are reported to have involved 335 municipalities, engendered 1,829 drinking water projects and 949 irrigation projects, benefited 400,000 families, and made it possible to add 42,000 hectares of agricultural land. On the other hand, a number of observers believe that the government focused more closely on water issues in the rural world, to the detriment of the country's major cities.

8 The government introduced a cable car system linking the cities of La Paz and El Alto to free up automobile traffic, reduce transport time, and improve pollution control. Symbolic of a modern approach to urban planning carried out in collaboration with a German company, the first phase of the project was completed in 2014 with the opening of three lines costing an estimated 207 million euros. Over the next few years, a further seven lines are planned.

Another explanation for the crisis was the lack of coordination between various projects. In effect, according to some figures[9], 40% of water is lost from the pipes of the La Paz water distribution system; furthermore, the sheer age of some of the installations has the effect of diminishing the quality of water. But when the Morales government substantially enlarged the liquid hydrocarbon distribution network by linking the country's major and secondary cities to the natural gas network, the La Paz water authorities did not benefit from the program (digging of trenches) to modernize the water pipe system. The government could also have used the crisis and the fact that the dams were empty to clean them in order to reduce the build-up of minerals and improve water flow. For the experts, while climate change really exists, it has often been used by the government as a pretext for shirking some of its responsibilities.

The multiple interpretations and explanations of the crisis and the struggle between the protagonists to impose a legitimate vision of the water issue became a source of symbolic and political power. The government, City Hall, and the experts all sought, at this "critical moment," to appropriate that power for themselves. The conflict was symbolic because the struggle for the legitimate definition of the crisis in the public arena was linked to a series of interventions designed to reassure people and affirm a capacity of action and expertise, rather than to propose genuine solutions. The rival approaches proposed by City Hall and the government were largely developed as part of a fight over the definition of the legitimate institutional space in which water was to be governed. Their approaches were, therefore, designed as much to take up the political mantle of the savior of the nation as they were to shut out a rival who was considered not to be up to the task at hand. These struggles had an impact not only on "public debate," but also on realignments in political alliances.

"Bottom-up" coalitions: Social networks and the organization of protest

Alongside the institutions, networks were developed to pass on information and confront the problems associated with the water shortage. Most of these networks were developed in the city's Zona Sur, which was most deeply affected by water shortages. This development was based on two distinct dynamics specific to the social structure of the city. The first was articulated around local associations, the *Juntas Vecinales* ("Neighborhood Councils") belonging to the FEJUVE Sur (all the *Juntas Vecinales* of the Zona Sur are members of this federation), itself a part of the La Paz FEJUVE. Long-established organizations based in urban areas, these

9 It is generally thought that a loss of 20% (leaks, etc.) is an acceptable rate for a high quality technical system in Europe. On this subject, see Barraqué et al. (2011).

neighborhood councils played a decisive role in the "Water War" in El Alto in 2005. But, at the time of the 2016 crisis, the FEJUVEs (El Alto, La Paz, Sur) were riven by division. In effect, there were several parallel FEJUVEs, some recognized by Evo Morales's Movimiento al Socialismo party, others by the City Hall's Sol. Bo opposition. The FEJUVE Sur had links with the government but suffered from a lack of legitimacy in that it represented only a tiny minority of political leaders (it changed sides during the conflict, see above). Due to these divisions within the FEJUVE, it was the *Juntas Vecinales* that, closer to local people since they were geographically based in the neighborhoods, played a central role in organizing demonstrations. These councils were better organized in the neighborhoods on the outskirts of the Zona Sur, which were established more recently and are inhabited by less wealthy people.

Alongside these organizations, other networks were used by the "middle class" of the historic neighborhoods of the Zona Sur, who were not widely represented in local councils but were able to find alternative approaches to organization via the internet. Primarily led by environmentalist journalists and activists, Facebook sites such as "Agua para La Paz" enabled opposition voices to develop a coalition based on a shared concern. One journalist said that, due to the government's lack of clarity, he had got in contact with "experts" (some of them working on subjects other than water) in order to keep the population informed (journalist, *Pagina Siete*, 28/01/2017). Other citizen collectives organized workshops on the crisis, most of them focusing on NGO's favorite themes (climate change, etc.). Several interviewees claimed that these so-called "horizontal" forms of mobilization had the advantage of not putting organizations in the spotlight, thereby avoiding government attacks (loss of funding, loss of legal status, etc.).

A number of demonstrations focusing on wide-ranging and often contradictory claims were held by residents of the Zona Sur. For the *Juntas Vecinales* representing the poorest neighborhoods, the main objective was to obtain answers: "During the march we'd been on, we demanded answers. If there wasn't going to be any water, they should at least tell us 'there isn't going to be any, take care of what water you have, and we'll sort everything out.' But they didn't say 'we'll analyze and analyze,' and in the end we wasted every drop of water from the dams. And I don't think that was right, and as good neighbors we supported one of the marches and asked the EPSAS to answer our questions and tell us the truth" (President of the *Junta Vecinal* of Complementación El Pedregal, interview 08/02/2017). According to the director of FEJUVE Sur (elected during the crisis and an opponent of the government), the march was not as well attended as had been anticipated. The low turnout can be explained by the fact that the initiative was launched on the social networks by members of the "middle class," who did not work in tandem with the *Juntas Vecinales*. Another factor explaining the relatively low turnout of poorer neighborhoods is that residents of neighborhoods located on the outskirts were able to procure water

by using old recycling and rainwater collection techniques. According to the same FEJUVE Sur leader, "There weren't many people there because the *Juntas Vecinales* did not take on a leadership role as they should have done […] Listen, my own neighbors didn't turn up, even if I invited them to. Why? Because they have water. And they're used to not wasting it, so the shortage didn't have that much impact on them. But insofar as the central part of the city is concerned, people living in residential blocks suffered a lot."

On the other hand, for organizers in the wealthiest neighborhoods, the protests were a success. This view was expressed by a journalist working for the opposition newspaper, *Pagina Siete*, who was highly active on the social networks, and who lives in the comfortable neighborhood of Obrajes (District 21): "But these efforts, especially the first and second demonstrations, which included 6,000 and 7,000 people respectively, were, by the standards of La Paz, where middle class people generally don't take part in this kind of thing, very impressive. And I think that it got a lot of attention from the government and encouraged it to take immediate action. Obviously, they took a number of measures and the crisis got a little better" (interview, 28/01/2017). While, according to our interviewee, this was the biggest demonstration ever organized on the social networks, such initiatives have been decried by some neighborhood organizations which accuse them of having "politicized" protest by seeking scapegoats and attacking the government (in regard to certain projects), rather than providing answers to the main questions posed by residents and creating a united front to resolve the crisis. Others were less critical of the success of the march and the contacts made on that occasion between citizen groups and *Juntas Vecinales*. According to the President of the *Control Social* of District 21, it was the alliance's show of force that made it possible to obtain the emergency subsidy of 250,000 dollars from the government. Nevertheless, most of the leaders we talked to agreed on the fact that if the crisis had affected El Alto, the epicenter of the struggles against the private water service in 2005, the consequences would have been worse for the government, which had, in effect, feared a "Water War" similar to that of 2005 (interview with a member of the government, 26/01/2017).

Local organization: Differentiated forms of social capital

Due to the fact that they lacked an institutional structure capable of providing support, and to a shortfall in expertise in regard to traditional approaches to relations between the state and "Civil Society" (Lacroix and Le Gouill, 2018), the actions deployed by members of the "middle class" via social networks did not succeed in encouraging the authorities responsible for water distribution to take concrete measures to solve the problems of local people who, left to the mercies

of traditional neighborhood associations, encountered varying degrees of success. "[Social networks were used to] launch the campaign. Obviously, this was done after the neighborhood associations, who are, to varying degrees, interlocutors in this arena, made formal, official representations" (Journalist, *Pagina Siete*, interview 28/01/2017). It is, therefore, necessary to contextualize the influence of social networks in terms of organizing protest, and to consider the role of local associations who took responsibility for dealing with the water shortage. Our survey revealed occasional tensions and a lack of understanding between members of the political opposition who were busy questioning the government in the media, and local leaders who were more concerned with managing the crisis directly on a day-to-day basis: "Because, as a leader, neighbors come to you, full of pathos, saying 'There's no water! There's no water! That's why we place so little hope in our leaders'" (President *Junta Vecinal*, Complementación El Pedregal, interview 08/02/2007). The survey conducted in two Districts of the Zona Sur highlights different forms of protest and reveals the relations between the protagonists of the water sector. In District 21, which includes the neighborhood of Obrajes, leaders were able to navigate between municipal and governmental administrations to manage the water shortage. Meanwhile, in District 19, which covers the outskirts of Zona Sur, social organizations changed political tack and sided with the opposition.

First, District 21 provides a number of examples of the success of social organizations in terms of managing the crisis. Such organizations were largely made up of around forty *Juntas Vecinales* belonging to the FEJUVE Sur which, due to internal divisions, had lost all political power. Some leaders were accused of being more interested in representing the interests of the party in power than those of the District's residents. Because of the internal crisis affecting the FEJUVE, it was the *Juntas Vecinales* which played the role of privileged interlocutors with the EPSAS and the government via the Community Association (which includes the District's *Juntas Vecinales*) and the *Control Social* (a public authority responsible for representing the District at City Hall). The *Control Social* used its formal status to work directly with the La Paz municipal Department of Risk Management to examine the reservoirs in order to check the severity of the crisis and to organize the first emergency meetings with the *Juntas Vecinales*. In the neighborhoods, the *Juntas Vecinales* set up Water Commissions to which local secretaries were appointed. In order to obtain water tankers to help people through the periods during which water supply was curtailed, the presidents of these Commissions were encouraged to deal directly with EPSAS engineers with whom they managed the network on a daily basis, a task facilitated by the fact that their headquarters were located between La Paz and the Zona Sur, an area that required regular interventions from EPSAS engineers. "As a *Junta Vecinal*, we were set up to distribute water, to provide water tankers, and to avoid conflict. Each leader went to the place [where

the tankers were] to supply his or her neighborhood. We knew the leaders and so we were able to organize ourselves. So, later, they delivered 10,000 liter tankers for storage purposes" (President *Junta Vecinal* Alto Obrajes, District 21, interview 16/02/2017). They were then able to get in contact to the Army in order to deliver water tankers to their respective neighborhoods. Commissions and Water Secretaries could be tasked with contacting EPSAS managers to fetch water tankers and ensure that water was distributed fairly between residents in their respective areas: "Everything was coordinated with the leaders. We went to a meeting and told them the streets and places to leave the tankers, the places where the water tankers should be left. As *Juntas Vecinales*, we made sure that our affiliates had meetings every week to improve distribution and make sure that it was fair. Some people collected water in large containers, other people used smaller ones, so we had to regulate a little. We set up a commission so that two people could go every day. They had expenses for the trip and for phone calls, and the EPSAS supplied the tankers. That was our approach to distribution. The following day another group went, collected the water and distributed it, and the next day another group would go. That's how we organized ourselves (President *Junta Vecinal*, District 21, interview 21/02/2017).

The residents of District 21 got together to build a structure to host the tanks supplied by the City Hall and, later, by the government, using plans provided by the SMDEGIR but cutting out that organization in order to accelerate the process. Residents were also able to attend meetings with the EPSAS and the *Contingencia Militar* Committee. The legitimacy of the actions taken by neighborhood councils was also based on criticism of the lack of knowledge of the "terrain" by the soldiers sent by the government. Coordination was facilitated by good relations between the head of the *Control Social* and the representative of the Community Association, which made it possible to respond to the requests of all the *Juntas Vecinales* by organizing common meetings – even if some interviews revealed tensions between representatives close to City Hall and others closer to the government or to the EPSAS. The deepest tensions emerged during the transportation of water tankers, when some of them were "attacked" by people from neighborhoods which had been unable to establish the same kind of contacts with the EPSAS and the Army.

What happened in the neighborhood of Complementación El Pedregal in District 19 was entirely different from what occurred in District 21. In Complementación, two weeks went by before the first water tanker arrived. Founded in 2000, the new neighborhood was only connected to the EPSAS network in 2008, a period corresponding to the average time required in the agglomeration for infrastructure to be "consolidated" in newly developed areas (Poupeau, 2011). When outages were decreed, Complementación's representatives participated in District 19's crisis commissions with a view to being able to collect water tankers or wait for

them to be delivered locally. In effect, Complementación seemed to be sidelined by the efforts of EPSAS and the Army: "We went to fetch the tankers and bring them back here because, pathetically, they told us, 'it's coming, it's coming,' but the water tankers never came. That's why we got together to work with neighbors, forming a commission that went to the site, waited there, brought back the tanker, made calls; and there was another commission here waiting to knock on doors and make phone calls to get water delivered. This is how we organized ourselves during the water shortage" (President of the *Junta Vecinal*, Complementación El Pedregal, interview 08/02/2017). One of the difficulties encountered by Complementación El Pedregal is its dependence on the original neighborhood, El Pedregal, out of which it grew autonomously. In fact, it was not on the EPSAS's list of areas to which water tankers were to be sent.

The issue here is the way in which La Paz develops geographically and the inequalities that have emerged from problems associated with the definition of the city's borders (Poupeau, 2009). From an administrative point of view, Complementación El Pedregal belongs to the municipality of Palca. However, it also benefits, regarding town planning, from the technical support of La Paz City Hall, from EPSAS in regard to the water network, and from the department of La Paz for the electricity network. Less central than the neighborhoods of District 21, where risks of burst pipes had already been identified, Complementación El Pedregal did not enjoy the same kind of close contacts with EPSAS engineers as other neighborhoods, nor the same kind of access to local institutions, be it La Paz City Hall or the Ministry of Water and Environment.[10] Without knowing who to contact or which doors to knock on, the representatives of the neighborhood accused the EPSAS of having only responded to requests from neighborhoods politically close to the government while abandoning the others to their fate. "For me, they politicized [the water question]. What they were thinking was 'I want votes! I'll give you water and sanitation!' And they won people over, but they undermined their own cause by not making the kind of investment they should have made. In my view, they really politicized the situation. Because that's the EPSAS. Because I reckon that they've enlarged the networks a lot over the last few years but only on a 'you help me, I'll help you' basis. And they've made an effort, they've enlarged a lot of areas. As I told you, we'd lived without water for 10 years. We spent forever talking about the problem with the EPSAS, and a lot of neighbors in the area gave up fairly quickly. And there was this rumor that you had to work with the government to have access

10 The president of the *Junta Vecinal* of Complementación El Pedregal, who had, although she was originally from another part of the Zona Sur, come to live in the neighborhood when it was first set up in 2000, has a *baccalauréat* and works in the baby clothes industry. On the other hand, a leader of a *Junta Vecinal* in District 21, works for an MAS city councilor at La Paz City Hall, and has been President of the FEJUVE Sur and General Secretary of the Confederación de Constructores de Bolivia.

to water […] Because people were telling each other 'I don't have any water,' 'Go and work with MAS [Movimiento al Socialismo, which is Morales' organization and the main party of government] and they'll sort you out' (President of the *Junta Vecinal* Complementación El Pedregal, interview 8/2/2017). The leaders of the neighborhoods we interviewed were more critical of the management of the crisis; they claimed that the *Juntas Vecinales* were sidelined and that water tankers were never delivered at the right time or to the right place because the soldiers responsible for water supply did not know the territory.

The problem was also integral to the neighborhood. Unlike District 21, where the *Control Social* was able to use its formal status to deal directly with EPSAS engineers, the *Control Social* in District 19 had no political clout due to internal political divisions between, on the one hand, partisans of the MAS government and, on the other, Sol.Bo supporters in City Hall. Due to the fact that there were no intermediary levels (*Control Social* and Community Association) to communicate the requests of the *Juntas Vecinales* to the authorities, the strategy of these neighborhood organizations was to take a different track, by taking over the management of the FEJUVE Sur, which until then had been thought of as "ineffectual" because it was "manipulated" by people close to the governing party, MAS. In December 2016, the *Juntas Vecinales* in a large part of the Zona Sur organized a new internal election, which was won by Juan Carlos Carvajal, a leader from District 19, closer to the Sol.Bo party that controlled La Paz City Hall than to the government. Political realignments occurred in many neighborhoods during the crisis.

This inter-neighborhood dynamic shows how individual organizations sought to play a role in managing the crisis, both by responding directly to the demands of the population and by acquiring a greater degree of local influence. This dynamic was also noticeable in the claims made by these organizations. According to the leaders we met, the crisis enabled local organizations to restructure and become stronger at all hierarchical levels (*Juntas Vecinales*, Community Association, FEJUVE Sur). After becoming involved in efforts to resolve the crisis, these organizations now want to play a role in the day-to-day running of water distribution service. All of them mentioned groundwater sources, which are abundant in La Paz, taking the view that they should be explored and that the EPSAS and City Hall should recruit the expertise of local residents aiming at starting up local wells again.[11] These organizations take this approach not because they want to break with the central authorities (the EPSAS, the government, City Hall) but because they want to conquer a degree of legitimacy in the institutional sphere of water management.

11 Promoted by City Hall, this model differs from the government's major water projects. The main issue of contention is the lack of data on the quantity and quality of available water and on the risk of landslides in an already chaotic urban planning context.

Realigned coalitions: An interpretative model based on an analysis of networks

Thanks to an analysis of the water crisis in La Paz, we were able to produce a description of the various actors involved and the power relations by which they were constrained, as well as of the way in which coalitions realigned themselves, from the level of local organizations and City Hall to the approaches applied by the EPSAS, the central government, and domestic and international experts. We were thus able to select, based on the interviews conducted, the institutions pertinent to our survey, whose role in managing the crisis has been noted above. The description of this network is not intended to provide an exhaustive representation of all the actors in the water sector, but to deliver an interpretative model that can be used to further develop the analysis conducted above.

Several methodological approaches were applied. First, the directors or presidents of the organizations concerned were selected as representatives of specific types of positions. However, in regard to the EPSAS, the substantial number of functions, at various levels of action (neighborhoods, government, experts), encouraged us to select three representatives: the Director of the *Autoridad de Fiscalizacion y Control Social de Agua* (the AAPS); an engineer responsible for the neighborhoods studied; and a technician responsible for the service. Then, due to the substantial number of areas affected, two neighborhoods with different political characteristics were selected in the intention of developing a model describing networks of relations established between various levels of action (see above, "Bottom-up" coalitions: Social networks and the organization of protest"). In effect, the first interviews revealed opposing dynamics at work in Districts 19 and 21. This encouraged us to focus our interviews on these two districts in order to analyze certain subtleties in terms of local politics and social capital. Lastly, a model describing their relations was developed using a classificatory system established within the framework of a comparative international study of conflicts over water in urban and periurban areas in the Americas (Bolivia, Brazil, Colombia, Peru, Mexico, United States). Relations between the protagonists of the water sector during various crises are divided into six categories based on the Advocacy Coalition Framework *(Cf. supra Introduction; p. 12-57)* as applied to network analysis (Sabatier & Weible, 2005): 1/ Exchange of information; 2/ Mandatory coordination; 3/ Hierarchical coordination; 4/ Interested coordination; 5/ Pure Coalition Ally; 6/ Conflict. The fact that the survey was conducted over a short period of time (water shortages occurred at the end of the period dedicated to the case study) meant that we were unable to exploit all the aspects of the questionnaire, particularly on the subject of water policies developed with the objective of resolving the crisis. However, the content of the interviews was used to carry out a qualitative study of those policies.

First, the structure of the network *(Cf. Figure 1.1, Structure of the network and coalitions, p. 406)* constituted by the conflict's main protagonists reveals a space that is strongly interconnected, with a high degree of mutual knowledge among the various actors involved. The modularity of the links between these actors reveals three distinct groups, referred to here as "Communities." First, since public action was monopolized by the *Gabinete del Agua* in liaison with the EPSAS, the C1 community included those furthest removed from the actual, hands-on management of water shortages. This group included not only journalists, environmental activists and scientists, but also representatives of the Ministry of Environment. Even if some members of the C1 community crystallized relations between organizations opposed to non-municipal institutions associated with critiques of the government's management approach (the EPSAS, *Gabinete*, Ministry), their relations with the rest of the network mainly consisted in sharing information, and most of them were mobilized by the La Paz FEJUVE within an "Interested Coordination" framework. Their participation in the opposition coalition was thus more symbolic than real.

The C2 community includes actors in the conflict excluded, by the government, from a role in the management of the water crisis. Due to the government's attitude, they were forced to concentrate on attempting to gain control of communitarian organizations in order to influence the way in which water shortages were managed. Leaders close to the government, and who represented no other entity, were replaced by neighborhood politicians capable of working not only with the City Hall, but also with the EPSAS and the Army. If the conflict with the water company's management led to the members of this group aligning themselves with the opposition, this was only a temporary measure, or a form of "Mandatory Coordination" with EPSAS engineers in the neighborhoods. Two of the nodes of this Community also possessed substantial "social capital" based on the influence exerted by management institutions and neighborhood councils. The La Paz FEJUVE played a specific, representative role vis-à-vis the neighborhood councils making up its membership, acted as a gatekeeper in relation to the authorities responsible for water management, and also served as a point of liaison with activists (journalists, NGOs) and the neighborhoods. From this point of view, the conquest of the FEJUVE Sur mirrored a concern on the part of resident communities with public representation.

Last, Community C3 includes the most influential institutions and their closest allies. On the one hand, the *Gabinete de Agua* and the various departments of the EPSAS, the Authority (APPS) controlling the administration, and on-site engineers and the department responsible for planning; on the other, La Paz City Hall and its allies in the neighborhoods. It should also be noted that an opposition coalition was established between the City Hall and communitarian organizations including the *Juntas Vecinales* from the C2 (FEJUVE La Paz) and C3 (*Control*

Social) Communities. This can be described as a coalition because the principal struggle in the conflict was played out in C3 between La Paz City Hall and the *Gabinete de Agua*, whose intervention just a few days after the beginning of the crisis had the effect (it was also its intention) of sidelining its main rival. These two institutions, one permanent, the other conjunctural, were not only operational at the networks most important nodes – "Authority" and "Hub" – but they were also those most often mentioned by the various actors in the conflict, and the least constrained in their respective relations. It can thus be surmised that their influence was not depended on any "structural holes" that they were able to fill, in that the network appears to be relatively dense and restrictive. Indeed, we were able to observe that even neighborhood representatives had contacts at various administrative levels, be they with the City Hall, the government, or the EPSAS. The central position of these institutions is, in fact, counterbalanced only by one other institution on which, to some degree, they depend, namely the EPSAS Water Authority (APPS). The APPS has the power to intervene concretely and apply its detailed knowledge of the terrain and the specificities of individual territories (the engineers under its hierarchical authority are highly active in local neighborhoods). The AAPS's technical competence also provided it with a degree of authority which, although called into question during the crisis, was reestablished a few days after the first water outages by the appointment of the former head of the company (who had successfully negotiated the transition from the private to the public sector between 2007 and 2011).

These three classes of protagonists provide a fresh perspective on the development of coalitions during the conflict. The institutionally dominant government coalition and the opposition coalition acted at different levels. Articulated around La Paz City Hall, the opposition coalition (A2), previously engaged in a political struggle against the government, acquired the support not only from neighborhood organizations, but also from journalists and activists, who contributed to reinforcing its symbolic capital vis-à-vis the authorities, whose management approach was supposedly a "failure." This symbolic capital was associated not only with the expertise of external actors who applied their knowledge of climate change, but also with local knowledge supplied by institutions representing the neighborhoods. On the government side (Coalition A1), the emergency measures introduced by the *Gabinete del Agua* and supported by the newly appointed EPSAS leaders benefited from technical, human (Army) and financial resources, and from alliances – based on circumstances and shared interests – with neighborhood councils which were, in spite of the fact that they tended to align themselves politically with the opposition, in terms of water supplies, exclusively dependent on government agencies. Therefore, membership of specific coalitions was conditioned by the unequal resources of different neighborhoods and their leaders. For example, the *Control Social* of District 21 was able to support the City Hall in terms of managing the crisis, while also entering

into an "Interested Coordination" scenario with EPSAS engineers or with members of the *Gabinete del Agua*. The strategy of the neighborhoods can thus be described as pragmatic on several levels, sidelining unhelpful parties, while striking alliances with in order to guarantee water supply.

Conclusion: The instruments of water policy

The water shortages in La Paz gave rise to a conflict which not only revealed existing problems associated with the way in which water is managed by various institutions, but also had the effect of realigning coalitions of actors involved in the development of water policies. These changes were reflected in a reorganization of the opposition (NGOs, journalists, etc.) based on the issue of water; in a reorganization of neighborhood institutions and their place in the wider institutional sphere; and in a realignment of neighborhoods which, excluded from the management of the crisis, increasingly sided with the opposition. From this point of view, the intervention of the government, which set up a crisis cabinet and sent in the Army to manage operations, represented a turning point in what can be considered as struggle to define who was legitimately entitled to manage the water crisis. In the Bolivian political context, in which the water and gas wars of the 2000s were the founding events in the narrative of the conquest of power by the current government, state intervention was not only a way of defusing a potentially dangerous social conflict, but also a move designed to re-legitimize the government's position in the face of criticism.

As well as the properly so-called crisis, the conflict also encompassed the issue of which institutions had the necessary competences to manage water and sanitation. While responsibility for water management is constitutionally attributed to municipal governments – a situation acknowledged by local administrations –, in reality it is controlled by the government (MMAyA) via the EPSAS, which blocks the process of metropolitanization and whose actions are regarded as vital in terms of guaranteeing supply and carrying out any works required. If the accusation of a lack of anticipation on the part of the government and an absence of coordination with the government-run EPSAS can be used as an argument in favor of a higher degree of municipal control of water on the part of the City Hall and community authorities, the latter nevertheless demand massive investment from the government. In a political context in which the City Halls of La Paz and El Alto are both controlled by opposition parties, the realignment of water policy coalitions is, paradoxically, characterized by the notion of a "return to the State," a notion at the heart of a debate which, up until the crisis, had focused on a possible transformation of the public company into a metropolitan entity.

The underlying situation in Bolivia revealed by the 2016 water crisis was different from the more traditional configuration of the environmental conflicts

which initiated a cycle of protests culminating in Evo Morales's conquest of power. While the earlier conflicts were characterized by an unambiguous dichotomy between social movements and the government concerning policies promoting universal access to services and the national re-appropriation of natural resources, the crisis of 2016 was, from the point of view of the bureaucratic mechanisms involved, much more complex. It could be argued that what, over Latin America, has been referred to as the "governmental left" has, rather than altering environmental policy at a deep level, merely modified approaches to the regulation of natural resources and water distribution. Alongside the development of an alliance between the government, the EPSAS, and social organizations against municipal forces and their local support, there was also a fracture within residential communities, and a move towards excluding all forms of autonomous expertise. On the one hand, the government rejected the input of domestic and international NGOs, accusing them of being the agents of cultural and financial imperialism, and on the other, experts expressed their opposition to the government. Paradoxically, these realignments of coalitions encouraged the implementation of well-established technical solutions. Although they had differing views about what approaches to take, all the actors in the crisis admitted the need to find "new sources of supply" (water trucks, tanks, wells, water transfers with the deviation of the course of rivers, etc.). However, none of them suggested introducing additional ecological criteria into the analysis of the situation (notably in terms of government policies in the agricultural, energy and other sectors), and they never advocated the promotion of management instruments designed to regulate "demand" for water, particularly in terms of municipal regulations concerning construction projects in the metropolitan area.

It would appear that the new water policy coalitions that emerged from the 2016 crisis have not encouraged the introduction of management instruments fundamentally different to those that led to the crisis in the first place. While experts and NGOs promote the idea of water management long-term planning, the government focuses on the political urgency to find solutions. In this regard, the sidelining of domestic and international sources of scientific knowledge reveals another major characteristic of water policy in Bolivia, namely that it is still thought of primarily as a matter of solving technical engineering problems (Molle, 2009), and having no political content other than the attribution of funds to the infrastructure development department. In terms of implementing recycling solutions to deal with the emergency, no individuals received any encouragement from the institutions, either regarding funding or education; furthermore, nothing was done collectively in this area. While the water shortage has doubtless led to changes in perceptions and uses of water, it does not seem to have affected the "core values" (Sabatier & Jenkins, 1993) underpinning water policy in Bolivia, which is based on a quantitative administration of the resource (Barraqué, 2003) and a regional approach described by Mark Carey (2010) as "engineering the

Andes." Consequently, in terms of development programs, the practical expertise accumulated on the ground by the EPSAS in tandem with the neighborhood organizations was marginalized. Meanwhile, in the struggle over which institutions had the requisite skills to manage the drought, the idea of water as a "common good" that has to be protected was subjugated to the government's official ideology – summed up in the slogan, "vivir bien" – and this in a city where the demand for the resource is continuously increasing.

In spite of these problems, and of criticism of the government, the experts and social leaders we met continue to call for the public management of water. Experts argue that it will take more than just the actions of NGOs to successfully promote awareness of climate change and develop a "culture of water" (President of the *Control Social* – District 21, interview 17/02/2017) in Bolivia, and that such an approach must be supported by a national public policy like the one initially planned by the Morales government with its program of education about the environment and climate change. In the local neighborhoods, no leader mentioned a return to the private management of the water distribution service or suggested an exclusively "communitarian" system. However, everyone wanted to see the system run by a stable institution, with the reinforcement of the role of social organizations and local neighborhoods via the exploitation of groundwater sources. References to alternative expertise and practices that enabled the least wealthy residents to survive the crisis with ease recalled similar references to "customs and traditions" used during the Cochabamba Water War to promote a moral economy governing a common good associated with life (water) and a communitarian management approach (irrigation systems, cooperative wells) (Perreault, 2006). The approach advocated by experts can therefore be seen as the continuation of a form of instrumental rationality associating traditional subsistence and the market, common and private goods, and large-scale sociotechnical systems and small cooperative systems already analyzed in El Alto/La Paz (Botton, Hardy & Poupeau, 2016). Our survey thus reveals a shared dynamic articulated around the issue of water scarcity. While all the protagonists are aware that control of the water distribution system represents a form of power that no one wants to abandon, it also seems to them that issues of health, society, culture and economics are too important to be left to a single institution. Several individuals interviewed opined that water should not belong to the Bolivian state but to the Bolivian people. This collective accountability requires a greater degree of education about water and climate change delivered via courses and workshops designed to teach people to manage water more efficiently on a day-to-day basis, as well as via the introduction of new norms framing its use (re-evaluation of water rates, control of urban expansion).

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Works started without planification, and not achieved.

EXPLAINING PATH DEPENDANCE AND BLAME AVOIDANCE

Policy coalitions and water plan in Duque de Caxias City 2007-2016 (RJ, BRAZIL)

Gilles Massardier & Suyá Quintslr

Introduction: Failings in Water Management

This chapter deals with the case of the Municipal Plan of Basic Sanitation (*Plano Municipal de Saneamento Básico, PMSB*) in the city of Duque de Caxias (DdC) in Brazil (a million inhabitants) in the North of Rio de Janeiro city, incorporated into the Metropolitan Region of Rio de Janeiro (RMRJ)[1], in the East of the *Baixada Fluminense* area[2]. More specifically, it focuses on the failure to implement this plan, despite the law that makes it mandatory since 2007 for every municipality to do so[3]. Indeed, despite the formidable failings in water management in the city, DdC is the last of the municipalities in the RMRJ to have launched the drafting procedure for its plan, which was finally voted by the city council in June 2017. The article also focuses on the embedded stakes of the very problematic water supply in DdC. In

1 "Since its founding, in 1943, Duque de Caxias became a 'bedroom town' with a significant number of migrants seeking employment and a life opportunity in Rio de Janeiro. Its population, estimated by the Brazilian Institute of Geography and Statistics (IBGE, 2010) at 855,048 inhabitants, is almost exclusively urban (99.6%). Caxias has an annual GDP of R$ 29,148 billion (IBGE, 2010), the eighth largest Brazilian GDP and the second largest within the state of Rio de Janeiro. Its Human Development Index (HDI) is 0.753, according to the United Nations Program for Development (PNUD, 2000), below the HDI of the capital city, Rio de Janeiro (0.842) and the state average (0.807), occupying the 1,782nd position nationwide. According to official data from the city hall itself, 84.6% of its streets have a sewage collection network and 95% of homes have a treated water supply (PREFEITURA MUNICIPAL DE DUQUE DE CAXIAS, 2011)", Milani, Loureiro, 2013.

2 This paper is based on a research campaign that took place between July 2014 and November 2015, based itself on the BlueGrass approach and methodology of analysis (Massardier, Poupeau, Mayaux, Mercier, Cortinas, 2016).

3 Prior to this date, it was the Master Plan that served as the basis for the contract between the city and the State water company (CEDAE). The one concerning all sectors of municipal policies and, ultimately, having very little to do with water, apart from some general aspects of the environmental reclamation of water, notably for the Guanabara Bay zone of the city (Plano Director Municipal, Boletim official, n° 5, 124, Duque de Caxias, 1st November 2006). The latter was directly annexed to the Rio de Janeiro State company (CEDAE) in the City's service delegation contract.

this city, territorialized water policy tools are not implemented (especially, PMSB), to the benefit of a federated and technical-political policy coalition.

As of 1997, water-related policy-making in Brazil could have changed considerably, if the analysis remained limited to the texts (Abers, Keck, 2013, p. 6-7; Jacobi, Almeida Sinisgalli, Medeiros, Ribeiro Romeiro, 2009, p. 75). Indeed, in addition to the National Water Agency, the federal law of 1997 introduced a River Basin Committee intended to give direction to policies that were both more integrated and more participatory. In addition, another federal law in 2007 (federative national sanitation policy, national and municipal sanitation plans) obliged municipalities to draw up a PMSB and its conditioned federal funds and programs from Ministry of Cities (PAC…). In this sense this law was trying to attempt previous federative monopoly over water management policies (*estadual*). One of the principles of this law was to integrate water and sanitation services and infrastructures with efficient water resource management. In the 1970's the federal authority reinforced the state companies that managed both the water supply and sanitation. Alongside these institutional actors of the water sector, many others have come along in recent years to enrich the water policy universe: private service companies, neighbourhood and environment associations and their federations, but also the different user lobbies (industrial, agricultural federations, etc.), universities, philanthropic organizations, media, etc.

These two phenomena, institutional fragmentation and "unfettered population growth" (Massardier, 2008) of actors in the water field, might suggest that pluralism and democratic governance have been accomplished (Fracalanza, Nagy de O. Campos, Jacobi, 2009). However, this approach does not stand up to the "practical authority" analysis (Abers, Keck, 2013), so striking are the gaps between this fragmentation of actors mobilized by the water issue and the restricted universe of policy making on the one hand, and between the existence of institutions to manage water and failed implementation on the other hand. In actual fact, the policy process remained concentrated in the hands of the State services and the public enterprises of the same federated State, forming a powerful and dominant technical-political coalition and leaving the other stakeholders on the sidelines. This is exactly what has been the case in DdC since 2007.

The first part of the paper is dealing with the context of this blame avoidance logic. The second gives a reminder of the specificities of the city of DdC: the context of a peripheral city that is segregated but endowed with a highly protected industrial pole; the city's dependence on the *Guandu* hydroelectric system, which is continually being amplified but is never sufficient, but for which the city is at the "end of the line", the recurring conflicts, which started five decades ago, between industrialists and poorly supplied users. The third part presents and comments on the outcomes of the investigation made of coalitions mobilized by the stakes of the MPBS in the city. A technical-political coalition aligns the political entrepreneur of the State (governor) and a group of technicians stemming from the State water company, and assumes the

power to make water policies, thereby sidelining other less dominant coalitions, in the context of Brazilian water management, lacking technical and political resources. And finally, the fourth section presents the very recent re-composition of water coalitions and policies in DdC: new dynamics for implementation of the City Plan, link-up with a new metropolitan infrastructure plan, creation of a public municipal water company. The hypothesis is twofold: on the one hand, the city is quickly turning into a State-centred dominant coalition; on the other hand, and at the same time, the DdC municipal authorities elected in 2016 are empowered to acquire the technical and financial resources necessary for implementing a local water policy in compliance with the law of 2017. This hypothesis asks whether we are standing before a 'critical juncture' (Capoccia, 2015) in water policy coalitions in DdC that allows the abandonment of the 'blame avoidance' stance or, conversely, the continuity of blame avoidance (renewal of a strategy of redefining the problem) (Weaver, 1986).

Blame Avoidance: constrained abandonment of water management by the Ddc municipality

The starting point of this chapter is based on what might appear to be a paradox: on the one hand the PMSB and the associated federal funding could have provided an opportunity for the DdC municipality to take up the immense challenges of qualitative and quantitative management. Yet, despite the mantras during electoral jousting[4], nothing came of it between 2007, the date of the PMSB law, and 2016 (see third section). Not only did the city of DdC remain segregated, both in terms of access to water and in terms of quality – segregations that have been sources of redundant conflicts since the 1970s – but, moreover, the city never drew up a PMSB until June 2017.

Several facts bear witness to blame avoidance: apart from the existence of the PMSB, the PAC "saneamento" funds were not implemented, except for three small projects between 2007/2010 whose work remains unfinished. When work is carried out, it is in connection with the PSAM, a programme run from the federated State (INEA) with international funds (IDB as it happens). And lastly, revealing both the perpetuation of the inherited governance of the past decades and denial of competency, the last contract signed between CEDAE and the city of DdC contained few

4 For example, during the municipal election campaign of 2012, the candidate and future mayor, Alexandre Cardoso, declared: "They sign a contract of 30 years with CEDAE, but service that company should have been delivered never existed. A great part of the city past months without coming out any drop water from the taps. That's why, we are going to cancel this agreement and to create a water city company" (http://www.psb40.org.br/noticias/comicio-e-carreata-movimentam-a-campanha-40-em-duque-de-caxias), as did… 5 years after his successor and competitor in the beginning of January 2017, just after his election.

obligations for CEDAE, since it referred back to the general urban plan in which water management arrangements are barely touched upon and in a very general manner.

This is therefore in a blame avoidance context (Weaver, 1986)[5] characterized, in this case study, by three of the eight strategies developed by the elected representatives to avoid responsibilities and blame: limitation of the appearance of the water issue on the municipality's agenda (postponing of deadlines and decisions, announcement of measures never applied); an ongoing redefinition of the water problem to moderate, or even smother, controversies about the problems and disputes; the transfer of responsibilities to other bodies (federated or federal State, CEDAE, etc.) (Weaver,1986). Policy process here became a "blame game" (Hood, 2002)[6]. Up to the municipal election of 2017, there was no relation in DdC between electoral cycles and "saneamento" public policies, as already noted by Marques for the period 1980-90 (1998).

How can the following intriguing questions be answered: why have some policy professionals (Schumpeter, 1990) not made use of a public policy tool (Hood, 1983), a municipal water management plan (PMSB) and its conditioned federal funds, even though it would have enabled them to break free of blame avoidance strategies and remain on the electoral market by ensuring their re-election (Schumpeter 1990; Gaxie, 1986)?[7] Why did the city authorities

5 Much contemporary research, based on the Machiavelian principle whereby the Prince seeks above all not to be hated, focuses today on how elected representatives act and do not act, not according to the rational efficiency of the outcomes of an action, nor to the possibility of innovating to deal with a public issue, but on the contrary according to political rationality of protection from being blamed by voters. In our case study the intrigue is precisely based on the fact that the political system encourages blame avoidance.

6 "Disordered growth with emergence of popular neighbourhoods, slums, and poverty belts, lack of political and civic awareness of local inhabitants (which could require and oversee the execution of sanitation and infrastructure works), besides the successive populist governments, which were unable to treat the public good, could justify, at least partly, the situation described" (Milani, Loureiro, 2013).

7 It needs to be emphasized that the 1980s and beginning of the 1990s saw the existence of basic sanitation and connection equipment plans in *Baixada Fluminense*. However, this was in a different institutional and political context: a political junction (partisan) between the State and Municipalities and exclusive competency of the federated State in the matter. Between years 86 and 88 were realized works with objective to complement the water system supply (*Plano de Impacto* – Faria Lima and Chagas Freitas governments), to build sewage and sanitary network systema (*Plano Especial de Esgotamento da Baixada e São Gonçalo* – Leonel Brizola government and *Plano de Setorialização da Rede de Abastecimento de* Água – Moreira Franco government). In the municipalities of Duque de Caxias and networks coverage was from 0% in the 80s to 31% e 56% during 90s. This was up to the 2000s with the *Programa de Ação Social em Saneamento* (PASS), combined with Pro-Saneamento Rio and *Comunidades Solidaria e Reduçao da Mortalidade de Infancia*, whose implementation seemed to rely on multi-level governance, dominated by the federated State granted, but which also involved ABES (engineers' association), CREA, FAPERJ, the *Politico de Saneamento e Meio Ambiente da Baixada Fluminense* commitee (from civil society, see below), and the municipalities (Queiroz Ribeiro, p. 459, 2015).

wait for 10 years (2007-2017), and the last date beyond which federal funds would no longer be allocated, for want of adopting a PMSB, only to adopt one on 23th, June 2017[8]? Why did the local activist organizations never manage to impose upon the municipality the obligation to consult, which was linked to these plans?

The working hypothesis is that this situation is not only explainable by the strategic calculations of politics professionals seeking gains on the electoral market, as Weaver's approach suggests (1986). This political rationality of blame and responsibility avoidance is also, and maybe primarily, imposed by some structural variables, notably the divide existing between the municipal actors and the dominant technical-political coalition centred on the link-up between the hydrocracy of the federated State of RJ and the political enterprise of its governor.

Working hypothesis: the municipality and DdC stakeholders are hindered by their divide from the powerful technical-political and State-centred coalition

In the Duque de Caxias case, not only is the municipal plan not ready and not implemented yet, not only does the River Basin Committee remain marginal, but above all the federated State level (*estadual*) remains all-powerful in policy-making: a State technical-political coalition dominates water policy-making. Indeed, this research explains this situation by considering three main variables that constrain the actions of the elected city councillors or activists: i) the long-lasting domination of a technical-political policy coalition centred on the federated State level; ii) the difficult interlinking between policy levels (municipal, State, federal): between the "political entrepreneurs" (as stated by M. Weber) who control these various levels; between bureaucracies, planning and funding each policy level, as mentioned by Klink: "the substantial federal allocation of financial resources through the PAC and MCMV – federal investment programmes – proved something of a mixed blessing. It consolidated a diffused national politics of scale, whereby projects were not embedded within broader plans or plan-making processes, while plans remained empty, disconnected from the effective implementation of projects on the ground" (Klink, 2013, p. 1175); between advocacies and issues on each level: quantity and big infrastructure (*Guandu* hydroelectric system) and metropolitan supply is the advocacy of the dominant and State-centred technical-political coalition *vs* quality and sanitary alternatives problems at DdC level, iii) the integration and logic of these first two variables is possible thanks to a third one, namely path

8 Carlos Mello, Secretaria de Urbanismo de Caxias apresenta Plano de Saneamento Básicohttps, TV Câmara Duque de Caxias ://www.youtube.com/watch?v=aXvOuPLomUM.

dependence[9]: on the one hand, path dependence on the federated dominant coalition, and on the other hand, through the recent history of the State of Rio de Janeiro, path dependence on policy-making monopolization by this technical-political coalition centred on three specialized State institutions (the State water company – CEDAE, the Environmental Institute of the Federated State of Rio de Janeiro – INEA and the Environmental Secretariat of Rio de Janeiro state – SEA) on the one hand, and dependence on the outcome of this policy coalition, namely the *Guandu* hydroelectric mega-system on the other hand.

In theoretical terms, this case study demonstrates that, despite very recent institutional changes and innovations in water policy instruments (drafting of a city water plan, process of the creation of an inter-city level and of a municipal company for water management), policies depend on "paths" (Mahoney, Thelen, 2015), the social structures of the technical-political dominant policy coalition (existing for a century), particularly over the last four decades. The inexistence of a municipal water plan in DdC is the result of this dependence, in which the dominant policy coalition (Sabatier, Jenkins-Smith, 1993) plays a great role. This case study perfectly illustrates two elements structuring water policies in Brazil. The first one is path dependence on the "paradigm of water quantity and water systems" of massive production and transfers of water based on the construction and amplification of 'mega systems' (it is said that the *Guandu* hydroelectric system in Rio de Janeiro State is the largest of its kind in the world, see accompanying *Box 1, p. 95)*. Secondly, a path dependence that needs to be understood in the context of the paradox of the contemporary policy process: while multiple actors are galvanized by water issues, policies are decided and implemented by a limited number of those actors (Massardier, 2013) in a dominant technical-political coalition more concentrated at the federated state level. This coalition is made up of water technicians (group of civil engineers, civil servants affiliated to the political State enterprise of the moment, and from State agencies involved in water (Environmental agency and federated hydrocracy), along with the governors and their close collaborators (Marques, 1998) *(Cf. Box 1; p. 95).*

This chapter explains this 'blame avoidance' logic by way of the multi-level coalitions of the water management sub-system. The figure that represents it *(Cf. Figure 2.1, second section, p. 407)* identifies individuals grouped in distinct coalitions, according to how they see the conflicts around water in this city

9 "Path dependence occurs when the choice of key actors at critical juncture points leads to the formation of institutions that have self-reproducting properties" (Mahoney, 2001). The starting point for the historical neo-institutionalists is the pluralist idea that conflicts between rival groups over resources lie at the heart of politics, but they stress that the course taken by the political or economic structure where the conflict takes place will give precedence to some interests over others, sparking asymmetrical power conflicts and relative advantages (Hall, Taylor, 2003).

(quantity *vs* quality), their preferences in terms of management (plan *vs* inaction or unplanned interventions based on 'pork barrel'), or the institutions to which they belong (NGO, Municipality, Federated State, etc.), their professional and activist backgrounds (civil or chemical engineers, elected representatives, schoolteachers, historical activists of neighbourhood associations, etc.), their resources (expert, political, activist) and of course their type of interactions (cooperative or simply institutional/hierarchical).

1. Guandu hydroelectric system: structuring socio-technical policy tool, advocacy of the dominant technical-political coaliltion

The history of the *Guandu* system is one of successive expansions to meet the increasing demand for water and electricity bound to demography and industrialization, as is the case in DdC, with the setting-up of the petrochemical pole in the 1970s. The expansion of this instrument is the advocacy of the dominant technical-political coalition.

Built in the 1950s, the *Guandu* hydroelectric system (Canadian company, Ligth Electric S.A.) is the principal water supply system of the Metropolitan Region of Rio de Janeiro, for more than 9 million inhabitants. It transfers water from the river Paraíba do Sul to the river Guandu in the South, which is taken off from the river Guandu, and treated at the Guandu water treatment station whose production capacity exceeds 43m^3/s. Part of the treated water (about 21m^3/s) meet the needs of the South Zone of Rio de Janeiro. The rest goes to the Marapicu reservoir and distribute water to the West and North zones of the city of Rio de Janeiro and the *Baixada Fluminense* (Quintslr and Britto, 2014), including DdC. Two other water supply systems, Acari and Taquara, exist but are precarious and secondary solutions, supply the municipality of Rio de Janeiro. The Acari system, which served part of Rio city and the Baixada, was then restructured to supply this region exclusively (Britto, 1995), mostly the municipalities of Nova Iguaçu, DdC and Belford Roxo (PERHI, 2014).

Set up in the early 1960s, the Petrobras industrial plant (REDUC) has driven the rise of the DdC petrochemical complex (Raulinho, 2013). Over the years, the growth of the petrochemical complex increased its demand for water, and REDUC started to extract water from *Guandu*. A new pipeline was built, crossing 48 km through the *Baixada Fluminense* municipalities to finally reach REDUC in DdC. Currently, since 2015, CEDAE's solution for supplying the demographic and industrial growth has been to extend, once again, the capacity of Guandu. In short, the current proposals of the State Government ➔

of Rio de Janeiro for solving the supply problems in Duque de Caxias involve both increasing production with *Guandu II,* and the use of water captured today by Petrobras. The current proposal is thus to involve the construction of a new reservoir and a new treatment station, to improve services in *Baixada Fluminense* and the West Zone of Rio de Janeiro. Subsequently, CEDAE plans is to double that volume. The CEDAE design also includes the construction of new reservoirs, mega-elevation (large pumps), and reform of the existing reservoirs and distribution network. DdC would mainly benefit from *Guandu II* by increased pressure in the pipeline of the *Baixada Fluminense,* in addition to the construction of reservoirs and network deployment. However, CEDAE recognizes some technical limitations of *Guandu II* and has put forward some additional proposals. Recognizing that REDUC does not use all the water captured in the *Guandu System,* CEDAE proposed (Petrobras/CEDAE agreement) the construction of a new treatment station with a capacity of 200 l/s, for the treatment of industrial uses supplying two tanks of 2500 litres each and another treatment station at the *Saracuruna* Dam, which is today also used by Petrobras to supply the petrochemical complex.

Coalitions focused on two different priorities: water quantity, water quality and their conflicts

Conflicts in DdC are characterized by issues about access to water, on the one hand, and issues about the quality of water, on the other hand. With only 60% of inhabitants connected up to the water supply network (though very sporadically supplied) and 44% to the sewerage network[10], Duque de Caxias is subject to fierce disputes linked to public health and lack of water. However, field research clearly shows that, while these two stakes could be embedded for certain actors of the dominant coalition (some of the technicians), for four decades the conflict surrounding water quality has more specifically mobilized a coalition of historical neighbourhood associations and their allies (Catholic church and its political branches in left-wing political parties, teacher trade unions, local universities, foundations and NGOs).

The discourses of the individuals in this coalition focus on four main issues: participation in the policy process, health problems, a constant water supply for consumers, floods due to a lack of sewers. The repertoire of action of this coalition

10 "In 2000, Duque de Caxias had 69.52% of its households connected to the treated water network, 27.84% of houses were supplied by wells or fountains, and 2.63% by other forms of supply (water truck, barrels on carts, rainwater) - with regard to the same kinds of distribution, Rio de Janeiro presented, respectively, 97.79%, 1.03%, and 1.18%" (Milani, Loureiro, 2013).

is a combination of second- and third-generation actions (Siméant, 2005): activism in political organizations or satellites, demonstrations, public meetings, communication activities (field visits for researchers, media and activists), to a lesser extent and according to periods, institutional activism on committees (Politix, 2005; Massardier & ali, 2012). However, the weakness and marginalization of those committees in the reality of Brazilian water decision-making reveal some striking facts about the network of actors considered in this paper: on the one hand, the fragility of institutional activism, with the gap between the main two coalitions *(Cf. Figure 2.1; p. 407)*. The dominant coalition, for its part, is characterized by three elements: its discourse about the quantity issue has focused on the *Guandu* hydroelectric system for 60 years *(Cf. Box 1, p. 95),* interactions between the political enterprises of the State governor and groups of technicians (private and civil servants civil engineers) that have been historically closed (Marques, 1998), and power and decision-making concentrated at State level. Thus, the field research consisted in observing, firstly the conflicts for water in the city of Duque de Caxias (DdC) and secondly the coalized interactions focused on the stake of failure to implement the municipal plan for water management (MPSB), even if a multi-level approach is necessary to understand this complex local situation.

Water issues in Duque de Caxias: "conter-example city"[11], conflicts in a segregated[12] peripherical city

It is impossible to separate the issue of sanitation and water supplies in DdC from that of water supplies in the whole metropolitan region of Rio de Janeiro city. Firstly, because both are recurring issues: all the municipalities on the periphery of the RMRJ are highly deficient and the subjects of frequent announcements, though to little or no avail. They are characterized by a Fordist "(semi)-peripheral national developmental state": in Brazil, between the 50s and 70s, by way of plans, "a national space economy was created through complementary and selective growth poles, but without giving effective priority to the social and environmental dimensions of urban and regional policies" (Klink, 2013, p. 1171). In DdC, a very strong petrochemical

11 http://noticias.band.uol.com.br/politica/noticias/100000500928/duque-de-caxias-e-antiexemplo-de-saneamento.html#.

12 For more information about social and economic segregation in Duque de Caxias: Simoes M. R., "Duque de Caxias no contexto regional metropolitan e da Baixada Fluminense", In Tenreiro (org.), *Duque de Caxias. A geographia de um espaço desigual, Editora Entormo*, 2015. To summarize the situation of the city, it is classified among the zones where the average per capita is the lowest of the metropolitan area (680 – 999 reais, compared with 5000-10000 reais in the "elite" southern areas of Rio de Janeiro city, ib, p. 57); the population linked up to the public water network is only 40% of inhabitants.

complex is very well supplied by the *Guandu* hydroelectric system and, by contrast, there is a very close concentration of poverty in a population that is unequipped and under-supplied. Secondly, because these issues are structured by a coalition game that concerns all RJ State (see part III). Advocacy's dominant coalition is more focused on the core supply of the metropolis. DdC has long depended on the whole area and on the *Guandu* hydroelectric mega-system (quantity advocacy of the dominant coalition), without any other alternative to its own failures (see below) and responding to failures by amplifying what already exists. This quantitative advocacy wins, once again, over quality advocacy: amplification of the *Guandu* infrastrucures (*Guandu* II) became once again the "choice" of the dominant technical-political coalition last year. Morever, the nomination, in January 2015, of the former director of the CEDAE production service as President-Director of the company (*Cf.* actor 29CEDAE on the coalitions, *Figure 2.1)* is, from this point of view, illustrative of the significance of dependence on a quantitative 'deep core' and on this major water production system/policy tool, while advocacy's dominated coalition is more centred on the supply of peripheral municipalities. And thirdly, because the paradigm of water production, hence the quantity of water, has dominated politics and policies in RJ State for a century - leaving quality (recovery and treatment) and the supply of the poorest areas of the metropolis by the wayside (Quintslr, Britto, 2014; Raulinho, 2013). These associated segregation and public health challenges are the advocacy of the dominated activist-hygienist-environmentalist coalition (activists of neighbourhood associations, urbanists, school and university chemists, hygienist foundations FIOCRUZ and FASE, etc. *Cf. Figure 2.1, p. 407).*

2. Four water markets in DdC : failures of policies and 'policies' of failures

The urban water of DdC is divided into four markets that leave the lion's share of water supplies to tanker trucks and informal systems. The reason is simple: the failures of the public network are numerous, be it in terms of pressure, treatment or connection.

Four markets operate alongside each other in DdC, based on the buying power of the inhabitants and according to the infrastructures available in the neighbourhoods of the city: 1. There is first of all that of the public network which is defective in two ways: it only supplies 60% of the population, usually in the city centre and, moreover, intermittently, making it necessary to store water in individual tanks[13]. 2. There is then that of the *caminhão pipa* (tanker ➔

13 https://extra.globo.com/noticias/rio/poco-artesiano-abastece-os-sem-agua-de-caxias-cidade-tem-121-mil-nessa-situacao-20961721.html.

truck deliveries), which is also defective for at least four reasons: it is unequal since it often doubles up for the public network due to its intermittence and/or supplies at a high cost for an already poor population; it is in the hands of private companies whose immediate interest is to prevent the expansion of the public network to perpetuate the market; for the same reason it is the source of a corrupt or even mafia-like system[14]. In addition, a certain number of informally organized markets on the edges of the defective formal markets (real estate with clandestine solicitors' offices, lottery, transport, etc.) owe their continued existence to collusion between the municipal political enterprises and armed militia (Arias, 2013; such collusion in the 'Caminhao pipa' sector was unambiguously confirmed during an interview with activist of the de DdC neighbourhood associations). "Milícia became an arm of the government and of two major political machines, which enabled the armed actor to deepen local control and play a leading role in policy development and implementation in the area. The milícia controlled social mobilization, civic groups, large parts of the economy, and was a protagonist in local elections, all the while maintaining a high level of basic security in the community" (Arias, 2013, p. 276). It needs to be said that political violence (three candidates murdered in the last municipal elections in DdC in 2016) is institutionalized and structures the local political field, with the militias funding the electoral campaigns of mayors or elected representatives (Arias, 2013, p. 275-276). The control of political violence by "private apparatuses of coercion" is one of the variables structuring access to municipal political power (Souza Alves, 2004). This was a clear limit to our survey, which needed to stop at the boundaries of danger for the investigators: it goes without saying that no representative of these militias and no link with them were investigated or included in the Figure 2.1 . Lastly, it is a source of political 'pork barrel' insofar as city hall does not hesitate to manage these clienteles (e.g. children in school) through subtle dosing of its water deliveries by tanker truck. A union representative from the professional body explained in an interview that the schools in the city depend on the good care of the municipality for their access to water deliveries by tanker truck, with the schools only being unable to open some weeks for two to three days, for lack of water in their tanks. 3. There is still the drinking water market via bottled mineral water, reserved for the wealthiest. 4. On the other hand, and lastly, there is the informal and illegal water market, which accounts for a fair share of access to water for numerous poor populations in the neighbourhoods on the outskirts of the city.

14 http://odia.ig.com.br/noticia/rio-de-janeiro/2015-12-17/quadrilha-acusada-de-vender-agua-impropria-para-consumo-e-presa.html.

This last market is represented, above all, by two types of access: clandestine take-off from the water channels crossing the city, for the poorest, and wells for the less poor. 'Pork barrel' leads some elected representatives to fund these illegal connections by supplying equipment to the inhabitants (piping, pumps, etc.) as well as very official programs for small farmers in the district of Xerem to access to water (by pumps)! They are defective in public health terms: these clandestine systems of untreated water takeoff from the rivers and streams, but into which waste water is also discharged, along with water from the industrial hub in particular, give rise to numerous illnesses, particularly in the neighbourhoods near the petrochemical complex. As for wells, they provide access to increasingly polluted underground water. The neighbourhood associations attempt to organize movements centred on these public health stakes[15].

Quantity issue: DdC as the "End of the Line" of the Guandu hydroelectric mega-system

DdC is predominantly supplied by the *Guandu* Hydroelectric System *(Cf. Box 1, p. 95)*. Two pipelines carry around 9.5 m^3/s of water for the whole *Baixada Fluminense* (Quintslr & Britto, 2014), including DdC, and the quantity is not enough to its uses – i.e., for the whole population of more than 3 million inhabitants and the many factories in this area. So, only downtown DdC is actually supplied by the *Guandu* system, though the supply is intermittent (only some days of the week). The city is in practice "at the end of the line" of the *Guandu* supply system, with water from feeders that carry water from West to East through *Baixada Fluminense*, supplying five other cities before reaching DdC, with a very deficient pressure. The rest of the city is supplied by small dam systems (Acari and Taquara) *(Cf. Box 1, p. 95)*. But they are irregular or interrupted because of cyanobacteria proliferation in the dam (Nowasky, interview, 2015). DdC has serious supply shortage problems, even with the other small dam systems. The public water supply network covers 62.5% of homes, with a sewerage system for 77.15% (IBGE, 2010). However, these statistics in fact mask population problems, because there are severe handicaps, with reduced and/or often intermittent access to basic urban services, such as water

15 http://www.ebc.com.br/noticias/brasil/2013/03/duque-de-caxias-tem-a-maior-proporcao-de-criancas-internadas-por-diarreia-na; http://www.pstu.org.br/rj-populacao-de-duque-de-caxias-sofre-com-falta-de-abastecimento-de-agua-e-energia/; https://extra.globo.com/noticias/rio/com-problemas-no-abastecimento-prefeitura-de-caxias-cria-companhia-municipal-de-agua-20820353.html; https://projetoiguacupaclotexv.blogspot.fr/2011/12/audiencia-publica-sobre-enchentes-em.html?m=1; http://www.jornalcapital.jor.br/materias/4121-moradores-fazem-manifestacao-reivindicando-agua-para-suas-casas.html.

supplies and sanitation. Conflicts over water use continue between an industry that is over-supplied with quality water and a population that is under-supplied with poor quality water *(Cf. Box 1, p. 95)*. To summarize, the city is suffering from a lack of water and a lack of pression, with the notable exception of the centre of the city and, broadly speaking, the petrochemical complex (Raulinho, 2013, p. 9). Lastly, there is a clear conflict between industrial (pipeline from *Guandu* for REDUC) and domestic uses of water, as inhabitants without access to the water network build illegal connections to the industrial pipelines *(Cf. Box 1, p. 95)*.

Quality issue: secret consumption and public health problems

As mentioned above, in the area next to REDUC, some DdC residents make their own illegal connections to pipelines that carry water to the petrochemical complex *(Cf. Box 2, p. 98).* This form of supply entails many problems: as it is illegal, it exposes offenders to cuts and penalties; given that the connections to the industrial pipeline are made precariously by the residents, sometimes by crossing streams polluted by sewage (*valões*), it increases the risk of contamination. In addition to that, many residents use wells to cope with the shortage of water in the city, but there is little information about the quality of the groundwater in an area where there is no sewage system and is highly polluted by factories. Others buy water from tanker trucks (*caminhão pipa*) *(Cf. Box 2, p. 98)*.

Policy coalition structures of the last decades: major reason explaning "Blame Avoidance" in the Ddc game

The case of the Duque de Caxias PMSB shows a type of conflict and opposition between the very classic coalitions of Brazil: a dominant, technical-political coalition confronts a coalition of individuals whose activist backgrounds are linked to the Catholic Church and to organizations representing the outlying neighbourhoods and to hygienist organizations, topped up for the last ten years or so by environmentalists. In 'deep core' terms, the credo of the first coalition makes quantity its cause, while the other is more attached to the issue of access to water and its quality. The structural divide between these two coalitions, shown by *Figure 2.1, p. 407*, is corroborated by direct observations of public meetings and the qualitative data gathered in interviews: ideas, practices, preferences, social resources and types of activism set the members of these two coalitions at loggerheads. Based on these variables, it is possible to define three coalitions: dominant technical-political, dominated technical-political, and dominated activist-hygienist-environmentalist.

Four variables were found to bring together or divide the players making up and structuring this network of coalitions between 2007 and 2016: i) opposition

between advocacies – quantity *vs* quality of water; the more the players were attached to the quantitativist cause (water production) and its instrument (*Guandu* hydroelectric system and its amplification) the more they integrated into and were at the centre of the dominant coalition, ii) the holding of technical capital over water, or not – the more the players acquired scholarly capital of the civil engineer type, and possibly chemist, the more they integrated into and were at the centre of the dominant coalition, iii) the activist and/or professional career pattern – the more it was linked to the political enterprise of the State governor, plus that of water management (CEDAE and hydrocracy of the federated State), the more the players integrated into and were at the centre of the dominant coalition, iv) the nature of the links – the more the players had links of cooperation, or their links were formal (institutional) or informal, the more they formed a coalition, while conversely, some players could have formal links in a committee (river basin or municipality based) but did not cooperate in taking action (organizing demonstrations, joint work on a project/system, etc.) and, consequently, did not go as far as to form a coalition.

Table 1 - Table of variables explaining the coalitions

	Localistic-qualitative/ Statist technicist	**Proximity to Governor's political enterprise**	**Cooperation/institutional links**	**Technical capital**
Dominant technical-poltiical coalition	Statist, technicist	YES	Cooperation link for projects implemented by the State and Guandu system management. Institutional links with other coalitions in the river basin committee	YES
Dominated technical-political coalition	Statist, technicist but moderated position on extension of the Guandu system/ against CEDAE privatisation	NO Proximity to a political enter-prise formerly in power (governor Anthony Garotinho, 1999-2002)	Cooperation links in union activity and organization of political meetings	YES
	Localistic-qualitative/ Statist technicist	**Proximity to Governor's political enterprise**	**Cooperation/institutional links**	**Technical capital**
Activist, hygienist-ecologist coaltion	Localistic-qualitiative	NO	Cooperation link in taking collective action (demonstrations, public meetings, etc.). Institutional links with other coalitions in the river basin and municipal committees	NO/or very little

Dominant political-technical coalition and its outcomes: municipal dependence on State policies and path dependence to the Guandu superstructure

In the case of Rio de Janeiro State and the city of Duque de Caxias, the characteristics mentioned above (dependence on the *Guandu* system, segregation of municipalities, particularly these of the *Baixada Fluminense*, including Duque de Caxias, with installations that are precarious, incomplete and/or defective in the same zones, and the proposal to amplify the *Guandu* system), result from policy-making and choices of tools adopted by a technical-political coalition that has dominated the water issue for more than a century.

This dominant coalition (indicated in red on the Figure of coalitions 2.1, p. 407) brings together two types of actors. The first type is that of the technicians, mostly members of the powerful body of civil engineers (secondarily chemists or legal experts), with a career either in the State water management company (CEDAE), or in the ministries of the federated State (public works, environment), or moving between the most salient[16]. It nonetheless needs to be pointed out that both the Secretary of Public Works and the Presidents and directors of CEDAE, do not necessarily come from the water sector. Starting in the 1980s in particular, while civil engineers retained the monopoly of the sector, the managers of the sector, who were highly dependent on the political sphere, could come from other sectors (e.g. cleaning services). In addition, this body of civil engineers specializing in water management are spread over several institutions whose close interactions form the coalition *(Cf. Figure 2.2, p. 408)*: the services of the State government, and notably the public works agency and the CEDAE (Marques, 1998). Without going into the details of the complex institutional background of CEDAE, it needs to be remembered that the latter has acquired a decision-making monopoly for water management. The first reason is that it has the required expertise, thanks to the integration of specialized civil engineering. The second is organizational: indeed, the law of 1967 delegated the totality of the powers in this field to State companies, thereby affirming the centralization of decision-making. In the 1970's, some water and sewage institutions were merged and gave rise to

16 The study by Marques (1998) shows that civil engineers of private public work companies also have great importance in this policy coalition. The author speaks of "permeability" between technicians of private and public companies in the form of a network in which circulates access to public markets in return for financial resources to the benefit of electoral campaign funding. However, our research did not take them into account. Public work companies are co-opted by this coalition: the interventions are part of the political clientelism of exchanges of services for votes in the applicant districts. As a source of funding for election campaigns, the market of public works controlled by CEDAE and its relations with public works companies through the non-competitive attribution of contracts (Marques, 1998), are particular interests of the political enterprise in power.

CEDAE. However, CEDAE staff is not homogenous. Marques (1998) made a close study of the Company between 1975 and 1998[17]: the groups of technicians of the CEDAE fused together, and still largely do so, according to their political leanings and according to their anointment by the political enterprise of the reigning governor. This explains that, in turn, these groups capture the powerful posts in the State company or secretariats according to these alliances between political technicians and professionals. The second type of actors is therefore that of the elected grandees of the majority party alliance in the Chamber of Deputies of the federated State (ALERJ) who back the political enterprise of the State governor, some being called upon to become Secretaries of State, the most visible in water matters being those of the public works and the environment secretariats (State hydrocracy incorporated it at the beginning of the 2000s). The current dominant partisan coalition is the one that backs Luiz Fernando de Souza (called Pezão) around the PMDB, party that has dominated the electoral politics of the federated State for two decades (2005-2017), with Pezão being himself the ex-Vice Governor of Sérgio Cabral Filho (who was also backed by an quasi identical parliamentary coalition) *(Cf. Figure 2.1, p. 407)*.

This dominant policy coalition is therefore characterized by strong collusion between these two types of actors, which, moreover, is not new (Marques 1998). This variable of political proximity is fundamental *(Figure 2.2, p. 408)*: depending on the political enterprises in power at federated State level, the power of the different groups and the senior managers fluctuates. Some isolated and marginalized groups remain in CEDAE, though without any real influence (see below, dominated technical-political coalition). In order to form a coalition, the variables of belonging to a technical corps and belonging to a group within CEDAE are thus completed by interactions between the technicians and the governor's political enterprise. The managers (presidents, directors) of CEDAE are answerable to the executive of the federated State insofar as they are nominated following the governor elections, with the cycle of the managerial teams at CEDAE usually following that of the elections, at State level only. The same goes for service management posts. For example, the second rank member of the senior staff (chemical engineer) in the CEDAE environment service was nominated vice-president of INEA (where he had already occupied a deputy post). This fact provided us with an opportunity to understand how much the collusive technical-political system described by Marques at the end of the 1990s remains to this day the variable that most explains the functioning of CEDAE and of the "deep core" of the dominant technical-political

17 This author showed that the power of the water engineers and technicians didn't have created a uniform group. The power in this organization is distributed to historically formed groups according to their institutional origin and to their generation. However, as explained above, the three last decades have seen some technicians from other sectors entering the organization, in managerial posts.

coalition. Interchangeability of the positions of these actors plays a crucial role in the maintenance of the coalition and its advocacy's "deep core". However, beyond this institutional proximity, CEDAE is an essential tool that works for the political enterprise of the State governor.

For instance, the inner balances of this technical-political coalition change considerably depending on the political periods and the political enterprises coming into power at the head of the State. The drawing up of water policies in the State is the result of coalization between the internal groups of CEDAE on the one hand (Marques, p. 156), and interpersonal and closed relations between the management of CEDAE affiliated to the Secretary of Public Works, INEA, and the governor's office on the other hand (Marques, p. 161).

The consequences of this cohesive structure, auto-centered on the political and bureaucratic logics of the federated State, are of two types. Firstly, this coalition is relatively cut off from the other actors involved with water, particularly at municipal level (even though these structures are very weak, or even non existing, including for a city the size of DdC). Beyond the case of DdC, the literature reveals, moreover, that despite the issuing of multiple laws decentralizing water management, notably to the municipalities, as is the case with the 2007 law, the State water companies have remained the key institutions: the "institutional and technological framework introduced by the National Sanitation Plan for the country's sanitation services survived practically intact in the operations of the State sanitation companies, which began to freely dictate the sector's agenda in the complete absence of any regulations under the new scenario". The institutional framework permitted "free action of State sanitation companies, which became a valuable bastion for State governors in a scenario in which State political powers were generally curtailed" (Souza, Rosario Costa, 2016). When regarding management of the supply and quality of water, by issuing the law of 2007 on the Municipal Sanitation Plans (PMSB), the State of Rio de Janeiro equipped itself in 2011 with a state programme called the "pact for cleaner water". To do so, the federated State relied on the combination of dedicated federated funds (FUNDHRI, etc.) and federal funds (PAC, etc.) making it the great authorizing body for water management.

This asymmetric competition between administration levels is a fundamental explanatory variable of the 'blame avoidance' stance of the DdC municipality for so many years. De facto, the conjunction of four variables (divide between levels, non-alignment with the State political enterprise, domination of the technical-political coalition, reinforcement of the federated State level and institutions by large federal programmes in the 2000s) have marginalized the municipalities yet a little more, as in DdC, in their incapacity to implement the PMSB.

The divide is not only institutional, it is also political. The political alignment of the municipal political enterprises and the federated State is not a token of cooperation between the levels. Proof of that lies in the municipal team of

Washington Reis (mayor between 2005 and 2008), who was nonetheless totally politically aligned in relation to the political enterprises of the governors (Cabral then Pezão), as all three belonged to the most powerful political party of the last three decades in RJ State, the Brazilian Democratic Movement Party (PMDB). Despite that, no initiative was taken to develop the PMSB (to be fair to him, the law on the PMSB dates from 2007). It goes without saying that, with the Brazilian political system amplifying this divide, the municipal teams in the partisan opposition to the coalition of the parties of the State governor were, for their part, totally sidelined. Such was the case between 2009 and 2012, since the Mayor's team (Zito, Brazilian Social Democratic Party, PSDB) was in the opposition with the coalition of the then governor (Cabral, PMDB). Such was also the case between 2012 and 2016 in particular: even while the mayor of DdC at the time (Cardoso) had been Secretary of State for water resources in RJ between 1999 and 2002 during Anthony Garotinho's government (PDT/PSB), and his Secretary General of the Mayor's Office (Luiz Fernando Couto) was a former manager of CEDAE (also between 1999 and 2002) and a leading member of the PT, they were structurally cut off from the dominant coalition of the time. The political game automatically rejected them from the dominant coalition between 2013 and 2016, while they had been at the centre between 1999 and 2002. In practice, while the city signed off three projects of the PAC (Growth Acceleration Program, federal funds conditioned by the PMSB) between 2007 and 2010, those funds ended and the PMSB went unheeded between 2007 and 2016.

Consequently, up to 2017, this dominant coalition prevented any alternative to blame avoidance stances. Indeed, the municipalities had three options: maintain that divide to the detriment of PMSB implementation, as was the case in DdC between 2007 and 2016; implement the PMSB and involve users on the municipal committees, as sought by the law, at the risk of appearing powerless since the technical and financial means were in fact controlled by the federated State; or else decide to radically break away from the logic of the governmental dominant technical-political coalition by creating a municipal management body making it possible to have the technical and financial tools to implement the PMSB, as was the choice of the new mayor of DdC in 2017 (see part III)[18].

The second consequence of this collusion is the oligopolistic tendency of the technical-political coalition regarding policy making for water in RMRJ. Its members accumulate the resources of power in their hands (the highest political responsibilities, access to federal and international funds, monopolization of

18 Or as the municipality of Niteroi has also been able to do, where the water supply and sanitation infrastructures are of a much better standard, but in a completely different socio-economic context, since the buying power of the population in that city ensures secure collection of levies and taxes, which is far from the case in DdC.

technical knowledge – especially civil engineering). Coalized in this way, they have likewise structured the water management policies of Rio de Janeiro State for several decades (as in other States): implementation of water policies is the result of close relations between CEDAE technicians, political elites and private public works companies.

Some slight connections have existed since the end of the 2000s, between some actors of the dominated activist-hygienist-environmental coalition (see below) and of the dominant technical-political coalition, involving some very specific actors and institutions: INEA and its Environmental Sanitation Programme (*Programa de Saneamento Ambiental*, PSAM) and the Guanabara committee. However, they are very weak. In 2009, INEA was created, attached to the RJ State Environment Agency. It is INEA that has been entrusted with managing the PSAM launched in 2010. This public policy tool fits in with the set of recompositions under the law of 2007 that brought in the Municipal Sanitation Plans (PMSB). In this respect, PSAM is directly in phase with the municipalities, since it is an aid in implementing the PMSBs. Some interactions are becoming established between the managers of PSAM and the neighbourhood associations. Plan drafting and follow-up meetings bring together the PSAM team and the municipalities. In addition, one of the partners in the project is the Guanabara Bay river basin committee (on which Duque de Caxias depends). This public policy tool thus creates interactions between the actors in an alliance of leaders, professors from different universities won over to other policy advocacies, and certain civil servants from the RJ State services, themselves promoters of these new water quality paradigms based on an environmentalist approach. A professor of the FIOCRUZ foundation wrote part of a report on the renovation of water policy in 2011. It should also be noted that international organizations, notably the IDB which funds 70% of PSAM, are taking part in the programme. However, the latter is at loggerheads with the municipal plan for Duque de Caxias by planning work when the plan for this city is not even under discussion yet. It is also greatly criticised by the associations of the aforementioned activist coalition. In February 2015, part of the PSAM team and its funding were decimated. One of the PSAM coordinators, actor 05SEA *(Figure.2.1, p. 407),* was relieved of her duties from one day to the next. Sometime earlier, she had attended a public meeting during which she had held exchanges with some representatives of civil society and of opposition parties. The eviction of this actor from the dominant coalition (albeit a link between the coalitions) is symptomatic of the fact that the political variable plays a role in structuring the dominant coalition. Although, she possessed all the assets of a central actor in the technical-political coalition (civil engineer, senior civil servant of the Environment Secretariat of the federated State). Her pronouncements and proximity to non-conformist players and views close to advocacy of the dominated coalition led to her expulsion from the dominant coalition. Yet she was one of the only brokers of DdC water policy configuration:

PSAM meetings in the neighbourhoods and municipality placed her in a position of cooperation with the other coalition. Such a stance is only tenable, apparently, if political allegiance to the governor is respected (as also shown by part IV).

A dominated technical-political coalition

The second, marginalized technical-political coalition (in blue in Figure 2.1), brings together the same two types of actors as the previous one, but which governed the State and controlled its structures two decades earlier around former governor Anthony Garotinho (PDT/PSB). During the first mandate of governor Brizola (PDT, 1984-1988), a group of civil servants at CEDAE broke away within the company (Marques, 1998, p. 190). It is likewise with the period of Governor Garotinho and his PT allies (1999-2002), who took over via the vice-governor and who propose, even today, some alternative technical solutions to those of the team currently in place. For example, Flavio Guedes, a chemical engineer at CEDAE, was its production manager over that period. Moreover, the beginning of the 2000s saw an attempt to politicize water matters. The Mines and Energy Commission at the time organized a public hearing to raise the water management issue (the subject of CEDAE privatization was already topical) and some supporters of the social vision of water management were heard (universalization of the service provided) with the situation in the cities of *Baixada*, including Duque de Caxias, being criticized by elected representatives (Mayor Zito of DdC attended), union representatives and Flavio Guedes himself, who was the director of CEDAE at the time[19]. The Secretary for Water Resources under the first Garotinho administration, between 1999 and 2002, was none other than the Mayor of DdC between 2012 and 2016 (Alexandre Cardoso, PSB, left-wing, backing the PT federal government), thus explaining the disconnection from the political enterprise of governors Cabral and Pezão (PMDB, right-wing).

Now union leader of SINTSAMA, Flavio Guedes continues to work in this technical-political coalition, drafting technical documents[20] and organizing public meetings, including in the company of former governor Garotinho. The mayor of DdC between 2012 and 2016, Alexandre Cardoso, has close ties with this technical-political coalition, since he was Secretary for Water Resources under the Garotinho administration between 1999 and 2002. Moreover, his case is illustrative of the disjunction between municipal and State political enterprises. Several factors

19 Comissao de Minas e Energia, Pimera audiência publica, 30/03/2001, ALERJ. This report particularly highlights the relation between political proximity with the political enterprise in power at State level and the municipal political enterprise. In 2001, during the hearing, the PSBB mayor of DdC (Zito, centre right) was sharply contradicted by the State Secretary for Sanitation and Water Resources (at the time a member of the coalition of Governor Gorotinho, PSB, right).

20 Projeto Água para a Baixada: Entrevista com Flávio Guedes Água para a Baixada: 17 Agosto 2013.

explain it: the first is, of course, belonging in the past to another no longer existing State political enterprise (Garotinho in this case); the second is the instability of partisan alliances that characterize the Brazilian political system (Carreirão, 2014): alliances change from one period to the next, so that everybody can be the friend (member of the partisan coalition in power at State level) of everybody else or, conversely, the enemy of everybody else (excluded from the partisan coalition); the third is the divide between the levels of action due to the classic disjunction between federal programmes and their local implementation (Pressman, Wildavski, 1972; Klink, 2013).

There is minimal disagreement with the first coalition as regards the basics for the *Guandu II* project (technical means of supplying Baxaida Fluminense, including DdC) and does not undermine the dependence on *Guandu*[21]. However, as we already know, proposal of the dominated technical-political coalition was rejected by CEDAE, which opted for *Guandu II*, deepening the dependence of RMRJ on that source. Opposition to CEDAE privatization is head-on (defended by the governor's current team and current director of the CEDAE State company, and opposed by both Flavio Guedes, the defeated Left of the end of the 1990s, and the union of CEDAE technicians).

This coalition reveals how much the variable of alternation between State political enterprises for the domination of the federated State is decisive for understanding three phenomena that structure water management in Rio de Janeiro State: i) changes in the dominant coalitions, over the long term, starting from the weight of electoral politics and partisan system variable, as Marques had already noted in his highly detailed study of networks (Marques, 1998), ii) domination of the State level, which cumulates the structuring resources, namely political and technical (notably the difficulty of cities in procuring technical management administrations that are powerful and durable), iii) the dependence of municipalities on the State-centred system, as without strong political links with the governor's political enterprise, notably partisan, the municipal level

21 With an isolated proposal from SINTSAMA (CEDAE, The Union of Workers in Basic Sanitation and Environment of Rio de Janeiro and Region): *Ribeirão das Lages* capture and network. SINTSAMA criticizes this dependence on a single source, and its persistence of inequality in services between Rio de Janeiro and peripheral municipalities is considered a project issue. SINTSAMA presented an alternative proposal, using water from the *Ribeirão das Lages* reservoir (this reservoir has been used since the 1940s, when two pipelines were built to supply the Brazilian capital with a total volume of 5.5m³/s). These pipelines currently convey water to the *Guandu* System, also supplying Japeri, Paracambi and Burnley. The original project, in the 1940s, included the construction of a third pipeline, but this was never done because of the choice of using the *Guandu* system. According to SINTSAMA, the construction of a unique system for Baixada Fluminense would help to pay off a "historical social debt [of] society and of [the] State" to this region (Guedes, 2015) on one hand, and to provide "strategic security" for the entire population of RMRJ, in the event of incidents in Paraíba/Guandu by emergency use of Ribeirão das Lages until re-establishment of the *Guandu* system.

is marginalized. This largely explains the marginal situation of DdC in urban infrastructure policies, notably for water.

An activist-hygienist-environmental dominated coalition.

Alongside the dominant coalition and its advocacy can be found other water policy approaches, geared towards water quality management: the third, activist-hygienist-environmentalist coalition (in green on the coalitions Figure 2.1), brings together activists from neighbourhood associations, universities and members of hygiene and environmental foundations, and unionists (particularly secondary school teachers).

Historically, it took social root in the urban social movements of the 1970s-80s, whose advocacies were of the hygienist and quality type. It was strengthened with the ability of those movements to gain direct access to the State governor (Brizola), particularly at the beginning of the 80s, when the Catholic Church (*Comunidades Eclesiais de Base* - Cebs) and left-wing parties, then the PT in the 1980s, formed an initial core and structured the fabric of the local activist organizations[22]. Most of the neighbourhood association leaders came from these (see, for example, Solange Bergami, who structured the neighbourhood associations in DdC at that time). This activist fabric, notably neighbourhood associations, led in 1983 to strong social mobilization (demonstrations) under the "*Sanéamento jà"* banner, and the creation of a Policy Committee for Sanitary Installations, Housing and the Environment in *Baixada Fluminense* (*Comitê Político de Saneamento, Habitação e Meio Ambiente da Baixada Fluminense*), informally, under the aegis of the neighbourhood associations of the municipalities of *Baixada*, including the MUB (*Federação Municipal das Associações de Moradores de Duque de Caxias*). These committees arose from the struggles against the military dictatorship (1964-1985). Another consequence was the creation of an explicit alliance between the government of Rio de Janeiro State at the time (Brizola) and these social movements (meeting in 1984 between this *Saneamento* committee and the State Secretary for Public Works and the Environment) (Porto, 2001).

These fragments of institutional activism (Politix, 2005; Massardier et al. 2013) then helped to bring about projects funded by international organizations and RJ State in certain Baixada neighbourhoods. This work considerably improved the rate of connection to the public networks, which was virtually zero prior to these federated State programmes (Porto, 2001). Once again, it is not a matter of heeding the siren's call of "participation", but to see the appearance here, at the same time as the technical-political coalition, of a coalition based on local leaderships long-since elected in their neighbourhood community (unionized teachers, neighbourhood

22 But not only, because the Protestant and Adventist churches organized (and still do today) a 'pork barell' for the redistribution of public services, in direct relation with local political leaders from the centre-right and the traffickers (Souza Alves, 2004).

activists, left-wing activists and/or catholic associations). This committee was a forum for sharing the problems encountered in their neighbourhood on a larger territorial scale, where a unified discourse is structured addressing the water shortages and sanitation problems on the one hand, and local disputes on the other. For example, the municipal sanitation plans made compulsory by the law of 2007 are deliberated/discussed there.

However, even the activists consider that period over. Today, the coalition is disconnected from the dominant federated State coalition. This activist network remains the backbone of activism in these communities, be it only through the fact of payrolling some permanent members (e.g. actor 06CEDAC, *Cf. Figure 2.1, p. 407)*, who develop the repertoire of action (local demonstrations, particularly on water issues, newspapers, tracts, press campaigns, etc.). Even today, many meetings, particularly regarding water issues, are held in churches of the diocese of the municipalities of São Jõao de Meriti and DdC. For example, the Sanitation Movement (*Movimento pro Saneamento*, MPS) set up recently arises from this activist history. This local social movement is very close to the Catholic church (meetings take place in churches, their members are themselves practising Catholics and/or activists in NGOs initiated by emblematic former Catholic activists: see Marcos Albuquerque, director of a current NGO in the coalitions, Figure 2.1 and to the diocese of *São João de Meriti-Duque de Caxias*, but also very close to the PT. Its resources are primarily linked to its ability to mobilize locally. It organizes regular marches and public meetings.

Arising from movements focusing on the sanitation issue and quality, water management disputes therefore historically structure the trajectory and leaderships of activists in their neighbourhood, and their discourse. However, it remains marginal in its ability to influence public policies for three main reasons. The first two are linked. What characterizes the 2000s and 2010s, unlike the previous period as already seen, is both the disjunction with the federated State (*estadual*) and the fragility of the very marginal local committees in the municipal decision-making process. The first reason is therefore the fact that this coalition is characterized by the weakness of the institutional activism of its members, including at municipal level (Politix, 2015; Massardier et al., 2013). The inclusion of some activists in participatory municipal committees does not mean inclusion in the dominant coalition: links are limited to an institutional obligation to be present, if that is the case. The divide is such that this environmental-sanitary coalition felt the need in 2016 to assemble outside the framework of the municipal committees to discuss the budding PMSB (but about which no information circulated). In one respect, the activists of the neighbourhood associations are integrated within the municipal committees, these neighbourhood leaders have entered the participatory tools of their city and, as such, very recently seem to be attempting to take over the municipal

sanitation plan introduced by the law of 2007. However, this municipalization of water policies and of the coalitions that might take over them does not appear to counter the autarkical system of the dominant coalition.

Paradoxically, these activists remain apart from municipal policies despite their involvement in the participatory bodies[23]. For example, a dialogue of the deaf became established during an informal meeting held in the wings of a municipal Participatory Council meeting at the *Unigrario* University on the PMSB, between actor 16CMDC-CONSEA-DC (MUB) and a civil servant from the DdC city Secretariat of Public Works. The two parties assumed the inexistence of a dialogue despite the municipal participatory councils and mutually blamed each other for the divide. The same applies for the river basin sub-committees set up by the 1997 federal water law. While some activists from neighbourhood associations were able to get involved, it was short-lived, notably in the Guanabara Bay committee, reflecting the weakness of those bodies, frequently highlighted moreover by the literature on water management in Brazil. The case of actor 02FAPP-BG is typical of this activism undergoing forced withdrawal from the official negotiating bodies. Originating from his neighbourhood's Catholic activism, the founder and leader of a local hygienist association (*Movimento Pro Saneamento*, MPS, already mentioned) in *São João de Meriti* (which overlaps into DdC via the joint diocese) cumulates three resources which make him a hub in this coalition: technical since he is a doctor of urban and regional planning and develops expertise on toxic pollution and its sanitary outcomes (publication of articles in university books and journals and substantial collaboration with the FIOCRUZ foundation); unionist, since he is a member of the active union of primary and secondary school teachers; activist, insofar as he is at the heart of an array of neighbourhood and catholic associations. All the same, his engagement in the Guanabara Bay river basin committee was, while important, very short-lived. DdC depends on the Guanabara Bay river basin committee, but the neighbourhood associations of the city are no longer involved in it. As already seen, their weakness is felt to be chronic.

In addition, when looking at the composition of these committees and especially their leadership, it is particularly the "major" users and technicians who predominate within them: CEDAE, Petrobras or water technicians (civil engineers and/or academics, sometimes in the "civil society" college) are strongly represented

23 This situation and the surveys conducted in Brazil and in DdC, particularly regarding education for example, show that the municipal participatory councils imposed by the law under the FUNDEF (Federal Education Fund) are victims of the same phenomenon of the virtual disconnection between the user and neighbourhood associations and the municipal administration. On the one hand, investment is complicated due to the lack of information on the policies applied; on the other hand, parallel technical committees implement education policies without referring back to the participatory council (Silvera, 2006).

on them. Thus, while these committees seem to be the strong arm of the civil engineers, they are nonetheless also potential spaces where links are created between different approaches to water resources and their uses. The activists, who are unable to play a role in the river basin committee where concertation with "civil society" is supposed to be structured, tend to organize their mobilization in parallel to this official consultation arena. Unlike in the 1970s-80s, the second reason is therefore the quite radical divide, notably between the neighbourhood associations and the same State management level. Moreover, this should not be confused with the multi-level nature of this coalition: local associations, be they neighbourhood or more strictly Catholic, have ramifications with the structuring of association federations, whose leaders also come from this local activism. Lastly, the third reason is that the relations between neighbourhoods and municipal services are highly client-based: "it is difficult to argue for the public good in a political system of client-based relations" said an historical activist of the neighbourhood associations of DdC. The low institutional activism of the neighbourhood associations is overcome by this other form of intervention, which makes relations difficult with the bureaucracy, notably any institutional activism, and transforms elected representatives and parties into simple organizations of private interests.

These multi-positioned activists thus form coalitions. They share the same discourse on the shortcomings of the water management policies in *Baixada Fluminense* and the solutions required. However, they are perfectly aware of the limitations of their activism, of their discourse among the inhabitants and of the types of action the coalition can take. They realise, on the one hand, that faced with the pork barrel practised by elected representatives, who intervene *ad hoc* in the neighbourhoods, it is difficult to mobilize the inhabitants on a day-to-day basis, and on the other hand, compared to the discourse of experts, they see in the discourse of the activists words that lack substance due to the difficulty in gaining access to information. Sometimes, the neighbourhood associations call upon the expertise of biologists, for example, or solicitors to take legal action and thereby shore up the conflict with the local authorities.

Using the terms of the network analysis, these three reasons dig a structural gap between the technical-political and activist-hygienist-environmentalist coalitions *(Figure 2.1).* Everything divides them, going beyond the almost exclusively qualitative causes defended by the latter: the resources of their members are radically different (few expert resources apart from some isolated cases, such as that of actor 02FAPP-BG, or of some academics or researchers from the FIOCRUZ Foundation, but who are marginalized due to their political stance opposing the governor's political enterprise) and, lastly, the relations with public bodies are weak and purely institutional (not cooperative), for lack of institutional activism.

Since the beginning of the 2000s, a second cluster of this coalition, which is more environmentalist, is becoming empowered. It argues for the

"environmentalization" of water policy and activism (the creation of INEA is symptomatic of that), the river basin committees, environmentalist associations and parties (see elected representative actor 37SEA, *Figure 2.1)* and foundations – such as FIOCRUZ - and a marginal fringe group of the public administration (service of PSAM incorporated into INEA, see actor 05SEA on the coalitions' *Figure 2.1*, see the above dominant coalition). For example, an activist of DdC, actor 12SCOBG *(Figure 2.1)*, is an activist of environmental associations and President of a sub-basin committee of Guanabara Bay, and has been a member of the City Committee of DdC since 2017. Institutional activism is currently professionalising this local activist and building him as one of the few actors who can act as a go-between, a broker between the coalitions. These actors are linked tenuously to dominant and dominated coalitions (see actors 05SEA and 12SCOBG). While quality and sanitation form "deep cores" in both clusters, the first is cemented by an advocacy, less of a technical approach, fluctuating between local demands and general policies (right to water, poverty, public health of inhabitants, etc.). This second cluster is thus more geared towards the environmentalist paradigm, notably on the advocacy of cleaning up Guanabara Bay, which receives untreated waste waters from whole *Baixada Fluminense*.

Last changes in water coalitions and policy in Ddc: a 'Critical Juncture' or continuity of 'Blame Game'?

At municipal level, the electoral variable operates on the side lines of water management. It is rather the recomposition of the dominant coalition that explains the transformation of water management in DdC. Granted, the municipal elections of 2016 led to centre-left/rightwing partisan alternation in DdC: the team of mayor Cardoso – PSB – was replaced by that of Reis, the new PMDB mayor, politically aligned with Governor Pezão. However, in 2015, the former mayor had launched the process of rapprochement with the dominant coalition, notably by placing the PMSB on the political agenda of his city (study contracts with the SERPEN and COBA – technical consultants – to design the PMSB). The variable of electoral alignment of the municipal level with the enterprise of the governor undoubtedly played a role in the decision of the new mayor to amplify that movement with the immediate creation of a municipal water company in DdC.

The municipality of DdC had begun to move closer to this last initiative since its beginnings in 2015, participating in the first meeting of the pact, with the former mayor himself breaking away from PT influence, which was rooted at federal level. This was after failing in another strategy in 2015 to obtain federal funds from the PAC. The DdC Secretary for the Environment (2015-2016) tried to negotiate funds from the federal PAC with the federal ministry of the city, to

implement an alternative solution to *Guandu*: proximity supplies and storage. In order to bypass the variable of political proximity with the State political enterprise, the Secretary tried to procure subsidies at federal level, seeking to benefit from the political proximity between the municipality of DdC (PSB) and the federal government (PT). But this was effectively without taking into account a basic detail: these ministerial funds are conditioned, under 2007 law, by implementation of the PMSB[24]. So, this strategy failed and obliged the municipality to convert to federated State initiatives (metropolitan plan for urban infrastructures). Since 2017, it seems that the DdC's Public works Department is aligning itself with the CEDAE solution of expanding the *Guandu* system and other equipment *(mentioned in Box 1, p. 95)*, and totally aligning with the advocacy of the dominant coalition.

Two variables explain this change of stance. A circumstantial one: with the victory, in November 2016, of the new PMDB mayor of DdC, a former ALERJ deputy from PMDB (party of the governor), is fully aligned with the State political enterprise of the current governor (he is from the same party, the PMDB, and a former elected representative of Rio de Janeiro State). A more structural variable, since 2016, is the recent appearance of new inter-city organization for infrastructure policies (transport, water, environment, etc.), strongly linked to and driven by Rio de Janeiro State. A new inter-city structure of the metropolitan region has just seen the light of day for the integration of urban infrastructure policies (moreover, the former mayor had already entered into this new dynamic), arising from the will of the federated State to integrate these public policies[25], and lastly, the activist-hygienist-environmentalist coalition was trying to appropriate the famous Municipal Sanitary Plan. In addition, the municipal actors have been designing the Sanitation Plan since 2016. However, its application is very piecemeal. On the one hand, the neighbourhood associations and their allies (Federal University of RJ, Fiocruz foundation, parish of São João de Meriti-Duque de Caxias) have been trying, since very recently, to take up the matter of the Municipal Plan. Some informal meetings have been organized (on the premises of the local university) attended by local leaders of the neighbourhood associations. These disorderly meetings were supposed to give rise to a force for proposals within the municipal commissions where the city's Municipal Sanitation

24 Direct negotiations in Brasilia in the offices of the Ministry of the City (meetings with the DdC Environment Secretary and with the head of the Minister of the City's office – himself a former civil servant of CEDAE – who confimed having met the latter but had refused the help requested on the basis of this conditionality.

25 Integrate in both senses of the word: the public policy sectors (water, solid waste, urban planning, climate change, etc.) and the institutions and levels of action. Articles 1 and 3 of the governor's decree Nº 42930 dated 18 April 2011 - O PACTO PELO SANEAMENTO será implementado por meio da ação integrada entre o Governo Estadual e os Municípios, sob a coordenação da Secretaria de Estado do Ambiente - SEA, com a participação da Companhia Estadual de Águas e Esgotos - CEDAE e dos Comitês de Bacias Hidrográficas.

Plan was to be discussed[26]. Meetings were organized by actor 15UERJ, a professor from the University of Grande Rio *(Figure 2.1)*. Organization was very flexible and access very open. However, the individuals present were the leaders of the neighbourhood associations, academics, former elected representative of left-wing parties. To resume, the participants were virtually all members of the dominated coalition. At the last meeting observed, exceptionally, a municipal civil servant was present and long and tough discussions took place about the gap between "civil society" and the administration of the city. Actor 16CMDC-CONSEA-DC blamed the representative of Municipal Secretary for Public Works for not taking into account the discourse of the local associations.

The very recent creation of an inter-city level (2016) with jurisdiction over water (also urban network policies such as transport) increases the complexity of the political and institutional stakes. The formation of the coalition around the union proposal, which so far appears to be defended almost exclusively by its members, remains unclear at this time. Rather, on the one hand, it is possible to draw the outlines of a broad coalition around the *Guandu* extension project (so called *Guandu II*), involving the current management of CEDAE, the former president of the Company and the State Government of Rio de Janeiro. On the other hand, we can identify another coalition that is less mobilized by supplies than by sanitation. It includes structured associations of citizens and of neighbourhood communities.

This study shows that an attempt at the 'metropolization' of policies would authorize negotiations between levels and the preparation of a municipal water plan. However, it would be optimistic to announce an end to the influence of the technical-political coalition, as certain institutional transformations are merely establishing some fragile localized coalitions around it. The law of 2007, which makes it compulsory for the municipalities to draw up their own municipal plan, may nonetheless suggest that this coalition might undergo some recompositions by obliging it to establish sustained links between the municipal services/elected representatives on the one hand and, on the other hand, the deep core of the technical-political coalition, i.e. the CEDAE technicians for the operationalization of the municipal plans. However, the discussion could be open to the following question: Are we standing before a "critical juncture" (Capoccia, 2015)? The emergence of the inter-city institution and level to implement infrastructure policies have changed the dominant coalition, and so far include municipal officials from Duque de Caxias and at the end active the PMBS of the city. In addition, having barely taken up his duties, the new mayor of DdC made good one of his campaign promises: the creation in March 2017 of the municipal water

26 Three meetings, direct observation methodology in April and November 2016.

company (*Central de* Água *e Saneamento de Duque de Caxias*, CASDUC[27]). It is responsible for implementing the Municipal Plan. Its first work will be to reopen the water reservoir, fallen into disuse, whose supply is disconnected from the *Guandu* system. CEDAE is a financial partner of this company, which is further expression of the current alignment between State and municipal policy levels. The classic variable in Brazilian federalism of the adjustment between levels via the majority parliamentary party of the federated Sate (the PMDB here) seems highly explanatory here, but at the same time insufficient. The mayor, who took up his duties on 1 January 2017, had already occupied the same seat at the turn of the 2010s. The hypothesis for explaining the new circumstances would therefore seem to be the recomposition of the dominant coalition observed in this chapter. Whatever the case, it seems that the new elected representatives of the city of DdC have entered into the classic scheme of choices between political action risks (that of the current municipality of DdC) and "blame avoidance", and to have broken away from the latter stance, which had consisted for decades in a failure to acknowledge the competencies available to the municipalities in order to act.

Conclusion

This study sought to bring out the variables explaining why a competency is not taken up, though it determines access to federated State funding, namely that of the sanitation and water management plan (*PMSB*), by the successive municipal authorities of DdC since 2007. The hypothesis was that the municipality was cut off from the dominant coalition that monopolises policy making on water issues at federated State level.

Some explanatory variables were brought to light that explained the structure of the coalitions: the concentration of power resources (social and political power of the body of civil engineers, centrality of the political enterprise that has electorally conquered the federated State) in a relatively closed coalition, at federated State level, and structurally set apart from coalitions supporting local and qualitative advocacy, and whose power has been constructed over the long term and is reproduced, around a technical public policy instrument (*Guandu*), that is so structuring that it makes the entire metropolitan territory dependent upon it, despite its marked failings for the most socially and geographically marginal populations. The links founding the coalitions are primarily cooperation (around a common objective and

27 Câmara Municipal de Duque de Caxias, Lei n° 2.826 de 6 de Janeiro de 2017, Cria a Central de Águas e Saneamento de Duque de Caxias – CASDUC – Ente Autárquico de Direito Público. The company was allocated wide-ranging competencies: coordinating urban planning, operate the public sewerage, water supply, sanitation and drainage service, and the installations inside buildings.

instruments) and those of representation and discourse sharing (quantity/federated State/technicity *vs* quality/neighbourhoods/actual life experience).

The hypothesis was doubly checked. On the one hand, if the municipality does not have links with the dominant coalition (whatever the partisan alignment), it finds itself structurally constrained to perpetuate the situation of blame avoidance, or solely manage in a clientelist manner some small-scale connection work and, in general, totally depend on the initiatives of the federated State. In other words, this situation results in a disjunction between the political territory of the municipal elected representatives and the territory of policy making and implementation that escapes them. On the other hand, if the municipality has links with the dominant coalition (whatever the partisan alignment), the urban planning instrument may regain favour. Such was furtively the case in 2007 with the releasing of federal PAC funds, or the beginnings of PMBS implementation since 2016. This dominant coalition currently seems to be in the process of undergoing a recomposition. This involves an opening up to political actors who widen the advocacy of the coalition to the defence of policy tools for coordination both between territories (metropolitan) and between policies (water, transport, environment, etc.). The implementation of these cooperative instruments that is currently under way also seems to be transforming the relationship existing between the dominant coalition and its rival: direct transformation by reconstructing the link between the municipal and State levels of management since the inter-city initiative is a forum for political dialogue between the elected representatives of the two levels; indirect transformation in that, at municipal level, some dispersed initiatives of dialogue between the neighbourhood associations themselves, but also with the municipal bodies, seem to be seeing the light of day. As a result, it seems that this state of affairs is, at last, enabling the activation of the municipal water management plan, at least within the discourse of the actors.

Are we at a "critical juncture" (Capoccia, 2015) ripe for the abandoning of blame avoidance or, on the contrary, are we standing before the continuity of blame avoidance as a renewal of the strategy of problem redefinition (Weiver, 1986)? Nonetheless, two things have to be said: although the municipality is within a cooperative framework, it nonetheless remains yoked to the initiatives of the federated State; the dominated coalition remains so, whatever the situation envisaged.

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A meeting of the North Shore Basin Committee in the State of São Paulo, in 2017 - The main arena for the continuous struggle of the coalitions.

FIGHTING FOR EQUAL INFRASTRUCTURES

Coalitions for the sanitation-sewage public policies in Ubatuba (São Paulo, Brazil)

Estela Macedo Alves, Natalia Dias Tadeu, Ana Paula Fracalanza, Paulo Antonio de Almeida Sinisgalli and Pedro Roberto Jacobi

Introduction: infrastructures and inequalities

According to the Federal Law N. 11.445 de 2007 – National Guidelines Law for Basic Sanitation (*Lei de Diretrizes Nacionais para o Saneamento Básico* - LDNSB), basic sanitation is defined as a set of services and infrastructures: water-supply operational installations, sewerage, urban cleaning and solid residue management and urban rainwater drainage management (MCIDADES, 2014). The sanitation range in the specific legislation refers either to the construction of physical structures or to the service supply. The National Basic Sanitation Plan (*Plano Nacional de Saneamento Básico* - PLANSAB), whose final version was approved in 2013, resulted from that law, and it covers different topics associated with sanitation, which, in the past, was taken care by different government bureaus, before the law started being coordinated by the Ministry of Cities and managed through an integrating view. PLANSAB also holds a shared responsibility profile, which was addressed in the 1988 Federal Constitution. The functions pointed out in the legislation are of planner, and service provider and regulator (having in mind that regulation is linked to entities and rules that must be followed by the Municipal Policy and by the Municipal Basic Sanitation Plans) (MCIDADES, 2014). Data presented in the 2008 National Sanitation Survey evince a concerning scenario: only 55% of the Brazilian counties have sewage services (IBGE, 2008), although Brazil is mostly composed of urban populations – 84.4% of the total population (IBGE, 2010).

This chapter focuses on Ubatuba County, on the north coast of São Paulo, which is provided with water and sanitary sewage supply, but it is far from representing universal access to it: only 25% of the total of houses in regularized and

licensed neighborhoods are connected to the sewage collection network *(Cf. Table 1, p. 126)*. This case study presents a conflict of interests around Ubatuba County multi-level regulation: despite the national legal frame, the Municipal Sanitation Plan and a local law (Municipal Law n° 3837, 2015), which states that 95% of the sewage collected in the location must be treated, the State sanitation company decides by its own interests which demand will be served as a priority. SABESP presents investment plans that do not include treatments in the range defined by law, not even intend to reach all neighborhoods with its services. On the other hand, local government is not prepared to solve sanitation problems, in terms of financial and technical resources. Assuming that the county sets the actions and services concerning sanitation, there is inconsistency in the fact that the county does not have the autonomy to define how to use its resources. Such situation shows the existing conflict in the decision-making process associated with governance levels about investments to be done in sanitation.

Besides that, it is analyzed how the decision-making process about investments in sanitation takes place in Ubatuba County, based on the conflict related to sanitation. It is an attempt to assess to which extent the process is centralized, or whether it results from participation and shared responsibility between representatives from different government levels. The hypothesis lies on the existence of a legal frame favorable to the participative governance of representatives from different government levels who work on decision-making about sanitation in Ubatuba County. Despite the space available to discuss and present the demands in a participative way, the final decisions still face political barriers and are centralized on the hands of state government agents, and such is the political heritage in place since the 1970s (Britto, 2012). Reflections of the conflict can be seen in the unbalance among population growth, the presence of fluctuating population, and the difficulty in meeting the sanitation sewage demands.

Information gathered through interviews and data about the actors influencing the topic were taken into account in the analysis. These data may concern the relation among actors, political activism, leadership, ways to claim for the sanitation demands, social practices, opinion about the relevance of the involved institutions, political instruments that must be adopted, or else divergences and convergences in opinions about the existing legal instruments. Primary data were collected from 14 semi-structured interviews, in which social actors were argued about questions linked to the topic, although they were free to develop viewpoints, opinions and to point out partners. The opinions from other five individuals were included and presented in the graphics; they result from research in electronic sites about news, public interviews, and official statements made by social actors in events and meetings. Data collection and interviews were conducted between July 2015 and January 2017 *(Cf. Annex 2 - Water resources and sanitation in Brazil: from the Centralized Management to the Multi-Level Governance; p. 40-49)*.

São Paulo Northern Coast and Ubatuba County Features

Ubatuba is located in the Northern coast of São Paulo State (NC-SP), in Southeastern Brazil. The region is formed by four counties: Caraguatatuba, São Sebastião, Ubatuba, and Ilhabela; they share specific laws and institutions. The total estimated population in the Northern coast was of 319,511 inhabitants in 2016 (IBGE, 2017); the four counties cover an area of 1,956.17 km^2 (SEADE, 2016) and 479 km of coastal extension (CETESB, 2015). Ubatuba territory covers 723.88 km^2 (IBGE, 2017) and has 200 km of sea shore (CETESB, 2015); the population living in Ubatuba was estimated in 84,872 in 2016 (IBGE, 2017).

The regional economy is strongly influenced by tourism, and the service sector is the strongest in the local economy. According to data from the State Data Analysis System Foundation (*Fundação Sistema Estadual de Análise de Dados* - SEADE), in Ubatuba, the value added to the services sector, as well as to the public administration, accounts for 83.92% of the total income in the county in 2014. The influence from the strong touristic character of the county on sanitation concerns the increased number of users resulting from fluctuating populations. The fluctuating population is an important factor to sanitation planning and to the considerations about investments to broaden the service. Approximately 650,000 tourists visit the coast in the high season, mainly during summer vacations and holidays. Approximately 350,000 tourists visit the region throughout the year, during the low season periods, according to data from SABESP, which is the current concessionaire in the region (CBH-LN, 2016). Besides the seasonal increase influenced by tourism, population growth in the region has been higher than the average in São Paulo State. The geometric annual growth rate (GAGR) of Ubatuba population between 2010 and 2016 was 1.27%, whereas the mean growth in São Paulo State was 0.85%.

According to the collected data and to the interviews conducted in the current research, the infrastructure network and the sanitary sewage services do not meet the demand. SABESP is responsible for providing water supply and sanitary sewage services in the four NC-SP counties since 1975, when the public services provided by state bureaus subjected to the federal government were centralized. Nowadays, the counties also play the role of subsidizing sanitation infrastructure, since they are responsible for the services; however, it may change depending on the municipal budget. It is worth highlighting that the assistance area taken into consideration in the statistical data is the central and urbanized one, which also presents updated documentation *(Cf. Table 1, p. 126)*. Neighborhoods far from the downtown region, even the consolidated ones, are not assisted by SABESP, given that its action range is not clear and the lack of contract set between the concessionaire and the county, as it was informed during the conducted interviews.

Table 1- Number of water and sewage connections and treatment plants
Data source in this column: IBGE. Censo - Sinopse – Domicílios Recenseados. Available at: <http://www.cidades.ibge.gov.br/xtras/uf.php?lang=&coduf=35&search=sao-paulo>. Accessed on: 03/01/2016.
Table elaborated by the authors based on data published by SABESP. Available at: <http://site.sabesp.com.br/site/interna/Municipio.aspx?secaoId=18&id=467>. Accessed on: 04/01/2017.

County	Housing Units	Number of connections and Percentage of total Housing units		Number of treatment plants	
		Water	Sewage	Water	Sewage
Caraguatatuba	64,740	53,108 82%	41,147 63%	4	4
Ubatuba	59,996	31,552 52%	12,254 20%	6	5
São Sebastião	43,259	23,610 54%	16,223 37%	7	6
Ilhabela	14,640	10,714 73%	4,402 30%	2	3

The public sanitation sewage system in Ubatuba is composed of five systems; three of them count on treatment stations, and two work only as pre-conditioning; therefore, the effluent is subsequently discharged in water courses, or in the ocean, through sea outfalls (SABESP, 2017). Thus, residual water presented great volume increase in the last decade due to the urban growth in Ubatuba, whereas the sewage networks remained centered in the downtown area. Sewage is not treated by SABESP, neither by the Ubatuba City Hall, it is discharged in water bodies and then flows to the sea. The quality of water on the beaches is checked by CETESB on a weekly basis and, then, it is assessed and signalized by the presence of red flags that inform visitors, locals and, mainly, tourists to stay away from the sea shore. It leads to negative consequences for the main economic activity in the city, namely: tourism. However, losses resulting from water body pollution mainly in the beaches are unknown. There are no data concerning the number of tourists who stop visiting the county due to pollution in the beaches, or who have health issues caused by the contaminated sea-water intake; however, such phenomenon is reported by locals, businessmen and public bureaus.

Sanitation sewage in Ubatuba: conflict caused by demand prioritization

According to the reports from the interviewees, the worse problems concerning the sanitation issue in Ubatuba are related to the lack of sewage and treated water, but

also to the weak supervision by the state bureaus – CETESB and DAEE do not have enough personnel to supervise all the problems associated with sewage collection precarity in the county. Moreover, since 2014, investment in sanitation sewage in NC-SP by SABESP was reduced; at this time, resources were used to solve emerging supply issues in other counties in São Paulo State.

The case study is based on the fact that, through a councilman, representing a demand from the population that asked for sewage treatment, they proposed and obtained a Municipal Law that determined that 100% of the sewage collected in the municipality should be treated by the company providing the service. This fact led to an investigation on the actions of public sectors in Ubatuba on the subject of sanitary sewage, since the proposal for a law of this kind should be elaborated through dialogue with other actors involved in sanitation services. In Ubatuba, besides that, a decision on sewage treatment should be accompanied by technical analysis, not just an isolated decision by a representative of the legislature. The motivation for the formulation of the law by a councilman of the municipality reflects the impatience of part of the impaired population, which is not served by the sewage services. They protest against the municipal city hall which does not implement sanitation policies, but also against the state sanitation company, SABESP, which decides where to work, independently of the demands and therefore does not serve areas that are not in its planning. Thus, we see a conflict that moves the entire municipality, and involves groups in dispute for divergent rights:

- The population of Ubatuba that demands the improvement of environmental quality, mainly the citizens directly affected by the absence of sewage system, who are represented by the figure of the councilman.
- The Municipal Government that, despite elaborating the Municipal Sanitation Plan, cannot negotiate the service agreement with the sanitation company and does not have its own resources to meet the municipal demands.
- The sanitation company, SABESP, under the command of the São Paulo state government, which does not have an updated contract with Ubatuba City Hall, and therefore performs the services according to the company's own planning and guidelines.

In this context, we study a conflict involving public policy instruments that are not compatible: The Municipal Sanitation Plan, Ubatuba City Hall; the lack of agreement clarifying duties of the concessionaire company with the municipality; Municipal law that requires treatment of sewage. And finally, legal procedures that make it impossible to meet the demand for sanitary sewage. Thus, the situation that generates the conflict studied in this chapter, refers to the municipal scale and the provision of an urban service at stake. In the sociograms, the actors consulted on the problem of the sanitary sewage in Ubatuba, involved in the situation directly explained in the local scale, or in an indeterminate way, have analyzed this situation, which is a multi-level one in relation to the decisions.

The conflict addressed in the present chapter covers social groups who fight for participating in decision-making processes concerning the sanitation sewage issue in Ubatuba, which are motivated by different factors, namely: improving the environmental quality in the beaches, which are the basis of the local touristic economy; prioritizing investments to solve hydric pollution issues caused by non-collected and non-treated sewage; and claiming for the universal right to sanitation. The deficit in the access to the sewage collection network in Ubatuba is related to lack of investment in sanitation, associated with high growth rates in the county (1.27% per year). According to one of the interviewees, an employee working in Ubatuba's City Hall (*Prefeitura Municipal de Ubatuba* - PMU) technical departments, for instance, there is great touristic affluence in the downtown area and in some neighborhoods. One interviewee also stated that middle and high-class condominiums give particular solutions for the produced sewage, but there is no supervision to these cases. Regarding non-assisted areas lacking the capacity to finance private systems, the local government has been making an effort to meet the demand by approving alternative sewage collection and treatment systems. According to the interviewee, there is lack of technicians trained to take actions in all the demanding neighborhoods. He stated that he took the responsibility for these tasks because he is sensitive to the problem and has the autonomy to do so.

Overall, sewage system projects are private, some alternative system projects are financed by the State Water Resources Fund (*Fundo Estadual de Recursos Hídricos* - FEHIDRO), which is distributed by the Northern Coast Hydrographic Basins Committee (*Comitê de Bacias Hidrográficas do Litoral Norte* - CBH-LN). According to another interviewee, who preferred not to be identified and is a state public server working in Ubatuba: (…) *if you walk on the sea shore, you don't see that it is Ubatuba, it is another place*. The statement refers to the precarious infrastructure in the neighborhoods away from the touristic center. Moreover, according to the PMU technician, there was no sanitation advancements during the administration in office between 2013 and 2016, because there was no connection between the bureaus and other institutions, not even integration concerning solutions for the sanitation issue in the county. In the interviewee's opinion: *the city grew a lot, but the City Hall didn't grow*.

Regarding the comparison of sanitation among the four counties in NC-SP, the city halls have different financial situations, which allows lower or greater investments in urban infrastructure projects focused on ending the lack of assistance. Income from oil royalties add to the usual municipal income. According to the research by Observatório dos Royalties (POLIS 2016), of the total income from oil industry royalties in NC-SP in 2014, Ubatuba was the county getting the smallest fraction of it (R$ 26,00 (US$ 11,00) *royalties per capita*), which corresponds to 0.9% of the total municipal income (R$ 2.918,00 (US$ 1.215,00) total income *per capita*). On the other hand, Ilhabela, which is the richest county, got R$ 4.521,00

(US$ 1.884,00) royalties *per capita*, which corresponds to 51.20% of the total municipal tax collection (R$ 8.825,00 (US$ 3.677,00) total income *per capita*).

The case below illustrates the herein addressed issue: it concerns Estufa II neighborhood, which holds 6,584 inhabitants[1] and is located in the so-called *Municipal Center District,* according to the Municipal Direction Plan (*Plano Diretor do Município*) (UBATUBA, 2006). This district is located in the urban area of the county, between Serra do Mar and the main road in the region (BR – 101), two kilometers away from Itaguá Beach. Overall, neighborhoods in Northern Coast seashore, which has as its limits Serra do Mar and BR-101, are less valued by the real state and touristic markets. These neighborhoods are occupied by local low-income populations due to their lower market value.

The sanitation sewage infrastructure in Estufa II is ready; however, SABESP did not start operating this branch of the network. The local newspaper[2], as well as the president of the Residents Association of Estufa II neighborhood, both reported that this branch of the sewage system was expected to be connected to the public network in July 2015.The president of the Residents Association of Estufa II neighborhood reported that the system was expected to be connected to the network since 2015. Many temporary drainage projects were put in place by PMU in order to stop the flooding caused by rainfall events, because these events mix rain water and the sewage discharged on the neighborhood's streets. The PMU representative stated in the report that he/she requested information from the concessionaire company, which never met the deadlines. The herein interviewed technicians stated that both in the case of Estufa II, or in different Ubatuba situations, there is lack of interest by SABESP in assisting the neighborhood due to the socioeconomic profile of its residents and their possible incapacity to pay for the services. In April 2017, more than once, PMU published reports about the topic in its website[3]: it reported a meeting with SABESP to assess the Estufa II connection to the sewage collection network. SABESP stated that it would perform the maintenance in the neighborhood's network, and that the existing network had never worked.

1 Population data of Ubatuba neighborhoods are outspread in commercial websites, they were not officially provided by Ubatuba City Hall, not even by the national bureau responsible for the Demographic census of Brazilian counties. Available at <http://populacao.net.br/populacao-estufa-ii_ubatuba_sp.html#>. Accessed on 08.16.2017.

2 In 06/02/2015, G1 Vale do Paraíba e Região Website: "Residents complain about sewage discharge in Estufa II in Ubatuba, SP". Available at <http://g1.globo.com/sp/vale-do-paraiba-regiao/noticia/2015/06/moradores-reclamam-de-despejo-de-esgoto-no-estufa-2-em-ubatuba-sp.html>. Accessed on 04.08.2017.

3 In 04.04.2017, Poder Executivo da Prefeitura Municipal de Ubatuba Website, MaisNotícias – Construction Municipal Bureau: "City Hall and SABESP set a target to connect the sewage system in Estufa II neighborhood". Available at <http://www.ubatuba.sp.gov.br/smma/prefeitura-e-sabesp-estabelecem-meta-para-ligacoes-de-esgoto-no-bairro-estufa-ii/>. Accessed on 04.08.2017.

The exposed situation is similar in other Ubatuba neighborhoods, and it shows the failure to meet the PMU sanitation target, and the lack of interest of the Sanitation Company in investing in all county neighborhoods. Moreover, general inefficiency features the institutions responsible for the sanitation and for providing the services. There are other non-explicit protagonists of the conflict: São Paulo State Sanitation and Water Resources Bureau representatives define SABESP's investment priorities. São Paulo State *Public* Prosecutor's Office (*Ministério Público do Estado de São Paulo* - MPSP) pressures PMU to act in order to solve environmental, irregular land occupation and public health issues. Representatives from the Ubatuba City Council advocate for the interests of communities that have voted on them. Environmental non-governmental organization (NGOs) capable of organizing social mobilizations advocate for pollution reduction in water bodies. Representatives from CBH-LN are responsible for the participative decentralization in the region. Finally, since 2012, a legal instrument was put in place to set the NC-SP insertion in Vale do Paraíba and the Northern Coast Metropolitan Region (*Região Metropolitana do Vale do Paraíba e Litoral Norte* - RMVPLN) (All those institutional relations are represented in *Annex 2; p.40-49*).

Such situation, among other demands, required the submission of decisions taken about basic sanitation in NC-SP counties to the RMVPLN Development Council, which is composed of state representatives, besides the mayors of the 39 participating counties. The management model suggested by RMVPLN shows that the responsibility for the services is shared by the City Hall, the metropolitan region, and São Paulo State government through SABESP (Alves, 2008).

Identifying and featuring the coalitions

Public policies are based on numerous factors, among them one can find the pressure from groups searching for solutions deriving from their respective ideas about a certain issue, which are the political coalitions. Public policies are seen as products from strategic interactions between people belonging to a certain political community who compete for power over other communities. Coalitions struggle to generate information, to change ways of thinking and to create environments favorable for the acceptance of their political propositions. Criteria to feature and define coalitions were created within the context of disputes for decisions made about sanitation sewage public policies in Ubatuba. The main assumption adopted to feature these coalitions lies on the fact that individuals were linked by their position in the defense of common ideas (Sabatier, 1988), which are implicit in their responses on how to reach their political goals.

Representations and personal resources: preliminary thematic typologies

The applied questionnaires searched for answers capable of evincing preferences, perceptions and general opinions of interviewees by applying semi-structured interviews, in which interlocutors could freely express their opinions. Information capable of describing the protagonists of the conflict were gathered through the data analysis process applied to interviews and collected data according to the systematization of answers about the topic *(Cf. Table 2; p. 132)*. The featuring was based on an analysis scheme which suggests the use of information and changes conquered through public policies resulting from variables found in the interviews. Individuals whose institutional origins can change – politicians, public servers, leadership groups, researchers, etc. – share a belief speech feature system, as well as take actions coordinated throughout a certain period, through the defense of common public policy propositions. The domination power of each coalition and the capacity to reach its interest will depend on its resources and political learning capacity, which results from the experience on political issues and from the evolution of technical-scientific knowledge on the topic (Vicente & Calmon, 2011). Table 2 *(p. 132)* presents the interviewees and the individuals involved in the political subsystem, who were identified through the organization they are part of and through a code created to be used in the sociogram, since the names of the individuals are not shown due to ethical guidelines. It is worth highlighting the emphasis given to the individual role of actors inside the coalition.

It was also possible to match social actors to the roles they can play in the coalitions according to the resources they have: financial, technical knowledge, mobilization capacity, authority, etc. Thus, the whole collected data, grouped into different themes enables the identification of common characteristics between interviewees that are at the basis of the coalitions, namely: values, ideas, political goals, ways to perceive and react to public policy issues. To do so, a preliminary typology of each of these themes was necessary and has been systematically realized. Figure 3.1 *(Typology of the perceived outcomes and resources through coalized action, p. 409)* presents four classes of actors among the ones pointed out as important for the subject. The four classes were defined by opinions on the way of acting when dealing with the issue of sewerage in Ubatuba.

Metropolitan Region and policy instruments application – advocates for the RMVPLN importance as a decision forum concerning sanitation in Ubatuba. Thus, the regional interests are the main guidelines for sanitation investments; therefore, they overcome municipal interests. Fundings are considered to be evenly shared, according to decisions centralized by the São Paulo State Government. This group was mostly against the political activism as an action model but pointed towards the need of new leaderships.

Table 2 - Interviewed stakeholders and their organizations or institutions
[1]Information from one or more actors of this group may have been obtained by interviewing, reporting, and other means of divulgation.

CODE	Name Institution/Organization	Institution/Organization description
MPSP-1	National and State Public Ministry	Organization responsible for monitoring compliance to the law
SMA-1	Secretariat of Environment of Ubatuba	Municipal department responsible for coordinating, controlling and performing activities related to environmental policy
SMA-2	Secretariat of Environment of Ubatuba	Municipal department responsible for coordinating, controlling and performing activities related to environmental policy
PMU-1	Ubatuba Municipality [1]	State organization, member of the federal system, local government
PMU-2	Ubatuba Municipality [1]	State organization, member of the federal system, local government
PMU-3	Ubatuba Municipality [1]	State organization, member of the federal system, local government
SSRH-1	SSRH State Secretariat of Water Resources[1]	Institution responsible for planning and executing state water and sanitation policies in all São Paulo State territory
SSRH-2	SSRH State Secretariat of Water Resources[1]	Institution responsible for planning and executing state water and sanitation policies in all São Paulo State territory
APPRU-1	NGOs	Non-governmental institutions that work on issues directly or indirectly related to water resources
DAEE-1	DAEE Water and Energy State Department[1]	State Autarchy responsible for conducting hydrological studies and for the concession of water use rights, among other functions
CBHLN-1	Watershed Committee	The committees are collegiate with normative, deliberative and consultative attributions
CBHLN-2	Watershed Committee	The committees are collegiate with normative, deliberative and consultative attributions
CBHLN-3	Watershed Committee	The committees are collegiate with normative, deliberative and consultative attributions
SABESP-1	SABESP[1] Basic Sanitation Company of São Paulo State	Mixed economy company; its main attribution is the provision of basic sanitation services in the State of São Paulo, aiming at its universalization
SABESP-2	SABESP[1] Basic Sanitation Company of São Paulo State	Mixed economy company; its main attribution is the provision of basic sanitation services in the State of São Paulo, aiming at its universalization
SABESP-3	SABESP[1] Basic Sanitation Company of São Paulo State	Mixed economy company; its main attribution is the provision of basic sanitation services in the State of São Paulo, aiming at its universalization
COAMBIEN-TAL-1	Neighborhood Associations Sanitation Cooperative	Civil society organizations representing residents of one neighborhood
CETESB-1	CETESB[1] Environmental Sanitation T echnology Company	Organization linked to São Paulo State government, responsible for controlling, supervising, monitoring and licensing activities that may cause environmental impacts
CAMARA-1	Ubatuba City Council	Chamber of municipal councilors

CODE	Name Institution/Organization	Institution/Organization description
TOTAL OF INTERVIEWEES		19
Not Int.-n	Actors cited by others but not interviewed	10
TOTAL MENTIONED AS INFLUENT IN THE SUBJECT		29

Table 3 - Acronyms

Acronym	Institution/Organization	
BNH	Banco Nacional de Habitação	National Housing Bank
CBH	Comitês de Bacias Hidrográficas	Hydrographic Basins Committees
CBH-LN	Comitês de Bacias Hidrográficas do Litoral Norte	Northern Coast Hydrographic Basins Committees
CETESB	Companhia Ambiental do Estado de São Paulo	São Paulo State Environmental Company
CONAMA	Conselho Nacional do Meio Ambiente	National Environment Council
DAEE	Departamento de Água e Energia Elétrica do Estado de São Paulo	Water and Energy State Department
DNAEE	Departamento Nacional de Águas e Energia Elétrica	National Water and Electric Power Department
FEHIDRO	Fundo Estadual de Recursos Hídricos	State Water Resources Fund
IBGE	Instituto Brasileiro de Geografia e Estatística	Brazilian Geography and Statistics Institute
LDNSB	Lei de Diretrizes Nacionais para o Saneamento Básico	National Guidelines Law for Basic Sanitation
MPSP	Ministério Público do Estado de São Paulo	São Paulo State Public Prosecutor's Office
NC-SP	Litoral Norte do Estado de São Paulo	Northern coast of São Paulo State
PLANASA	Plano Nacional de Saneamento	National Sanitation Plan
PLANSAB	Plano Nacional de Saneamento Básico	National Basic Sanitation Plan
PMU	Prefeitura Municipal de Ubatuba	Ubatuba City Hall
PNRH	Política Nacional de Recursos Hídricos	National Water Resources Policy
RMVPLN	Região Metropolitana do Vale do Paraíba e Litoral Norte	Vale do Paraíba and Northern Coast Metropolitan Region
SABESP	Companhia de Saneamento Básico do Estado de São Paulo	São Paulo State Basic Sanitation Company
SEADE	Fundação Sistema Estadual de Análise de Dados	State Data Analysis System Foundation
SMA	Secretário de Meio Ambiente	Secretary of Environment
SSRH	Secretaria Estadual de Recursos Hídricos	State Secretariat of Water Resources

Metropolitan Region and lobbying – advocates for the RMVPLN relevance as the decision forum concerning sanitation in Ubatuba. However, it suggests coordinated strategic actions in its influence network by pressuring and monitoring individuals in order to reach their goals, a fact that defines the concept of lobbying. These features are evinced in the graphic of answers *(Figure 3.1).*

Global common efficiency – represents the popular power, which is represented by the Ubatuba City Council representatives and is integrated to social movements and neighborhood leaderships. They defend the community's ideas, and decentralized local solutions to sanitation sewage, as well as boost social activism. They advocate for sanitation as a common good that must be pursued through instruments such as laws, land ownership regulation of urban occupations, and incentive to social participation in order to exert popular pressure on the governments. The positive answers presented in Figure 3.1 highlights the acknowledgement of new sanitation sewage demands in Ubatuba.

Juridical instruments' application and local governance autonomy group – advocates for more local power autonomy and for the non-centralization of decisions made in higher government levels, such as the State or RMVPLN. It is characterized by action practices such as making use of personal negotiations, whenever needed, and looking for the judicial power to solve public policy issues. It defends sanitation as a common good, the law enforcement to assure universal access, land ownership regulation of urban occupations, and incentive to social participation. However, it is different from the *Global common efficiency* class since participating individuals present better technical training (expertise) in topics related to sanitation, besides the fact that they keep personal and professional relations with a larger number of actors, which gives them more persuasion power in order to reach their political goals.

The sociogram presents the network of actors selected as important in the issue of sanitation sewage public policies in Ubatuba *(Cf. Figure 3.2 Sociogram of Policy Coalitions, p. 410)*. Most of them (colored spheres) were interviewed and some of them (grey circles) were just mentioned by the interviewees. Analyzing the structure of the network, illustrated on the following sociogram, there is a design molded by five communities, represented by the colored stains C1 to C5. They group the actors which usually work together, and usually frequent the same arena, although it does not mean they share the same values and ideas.

Links are other structural elements of the network represented on the sociogram. In the case shown in the following sociogram, the *Pure Coalition* link (black) usually occurs between actors belonging to the same coalition, which means that, even if the actors are not institutionally linked, they are sharing the same core values and working together to transform their views in public policy. In the network, it also stands out the *Interested Coordination* links, indicating that, although actors do not share the same core values, they exchange resources – money, staff, services –, which creates the coordination between two actors, for a short period. The interested coordination among actors of all coalitions represents that there is an intense activity in the arenas they take part in, and that coalitions tend to negotiate between each other.

Empirical experience at the field demonstrates that actors from different coalitions can dialogue by the intermediation of the North Coast Basin Committee, the main arena for this subject in Ubatuba. The Conflict links area is also structural on the network, once the coalitions' area is supported by the differences on the ideas and political instruments defended to solve the policy problems on sewerage system, besides competing to impose their views. Finally, the network has a few links classified as Hierarchical Coordination, Mandatory Coordination and Exchange of Information *(Cf. supra Introduction; p. 12-57)*.

A network of three identified coalitions

The compilation of results about the relations between social actors, as well as about power influences and actors' position in the political subsystem allows identifying three coalitions which are significantly linked to the previously described typology of the perceived outcomes and resources through coalized action. Each policy coalition is marked on the sociogram by a dashed line surrounding the concerned actors. The *Economic promotion of the territory* coalition gathers individuals (37% of the whole) who are mostly classified as integrating and prestigious people. They belong to the state government level and have the perception that there are very few problems related to sanitation sewage, and that there is a lack of expertise and acknowledgement of institutions to solve problems. They prefer public policies of economic character to be solved at state or Metropolitan Region level. They have economic and political influence on the decisions and, although they keep on acting on the topic on the long-term, they don't liaise with many actors.

The *Pro-environmental institutional* coalition gathers more than half of the individuals in the political subsystem (53%). Most of them are classified as very important actors; overall, they are local representatives or representatives of the municipal government. According to these actors, there are serious articulation problems between different water uses. They also have an alarming view about the sanitation sewage topic. The characteristic preference of this group stands out for the application of judicial instruments and for the autonomy of local government. Overall, they are heard in decisions made about public policies.

The *Pro-environmental non-institutional* coalition is the smallest of all the coalitions, it comprises two actors of the political subsystem. However, they are mobilizers and act as representatives elected by the local government, so that they can influence public policies. The perception this group has about the sanitation sewage issue is highly alarming, because they see it as a great social and environmental/ecological issue. They believe in and encourage the broaden social participation in decisions, and they perceive a global common efficiency of the coalized action in terms of outcomes and resources.

Conclusion

The possibility of having individuals participating in forums focused on discussing the public policy propositions is the reflex of a set of decision-making instruments in different governmental levels in the country. However, the centralization of decisions and the prioritization of investments in certain counties by the state government are clear. The ideology of São Paulo government representatives influences the decision-making process on water policy. The analysis enabled verifying that São Paulo State government has been defining the direction given to the financial resources reserved for investment in sanitation in Ubatuba; it was possible through SABESP, which is the service provider in the city, as well as through the representativeness of the state bureaus in the decision council about RMVPLN investments. The other protagonists remain advocating for their political priorities and succeed in certain situations; however, they are not essential for the final decision-making.

This is a scene of conflict caused by public policies focused on sanitation sewage in Ubatuba: in the most broaden governmental range – São Paulo State –, SABESP is the body that decides on how to use the budget. More recently, such decision has been influenced by the RMVPLN Development Council. Ubatuba county has little influence due to its peripheral economy and number of inhabitants, it ranks in a bad position in the investment priorities. The local executive power – City Hall – has limited technical and financial structure to meet the sewage demand in the county; besides the fact that the current administration has little interaction with the prevailing coalition, which includes representatives from the state government. Neighborhood associations represented by resident communities, environmental organizations and representatives from the City Council fight with the weapons they master: popular pressure and the search for punctual resources, such as little projects financed by private entities. Accordingly, it is noticeable that the sanitation issue in Ubatuba, as an environmental and economic issue, is far from being solved through public policies of broad range, so that the universal access to sanitation sewage is far from being achieved.

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A social protest in Zapotillo, Mexico.

OPENINGS FOR PUBLIC POLICY IN THE WATER RIGHTS

The conflict at the Zapotillo dam (Mexico)

Lorena Torres Bernardino

Introduction: water management questioned from below

Water management, as an environmental concern, reveals how a new issue is integrated to a State's political administration. Roth (2006) examines the evolution of the interaction between the State and its natural environment, indicating the changes in values that were developed in the public conscience during the twentieth Century. This evolution has tended to drive political life and action as issues of stewardship of natural resources, and it became paramount in both public policy and political life. The study of public policy for water usage is a case study of the closed nature of the institutions in charge with the creation and dissemination of water usage policies as well as the collective action brought forth by various advocacy groups concerned with the topic. Likewise, the study of the various processes that lead to action in this sector and their impact on both the environment and society is linked to a collective action designed for the environment, industry and advocacy groups, and the stewardship of water resources is a vital component of this developing conflict. This paper will show the political character of water management issues and focus on the examination of the evidence of these concerns in the Zapotillo dam Conflict.

The conflict that began with the construction of the Zapotillo dam (a full description of this process can be found in chapter eleven of the Zapotillo by Eric Mollard) illustrates the paradigmatic nature of how water management has been handled in Mexico. The same process repeats itself in the hydroelectric project Canon de Usumacinta in the southeast of the country and the Lerma System in central Mexico. The specific consequences and their protracted length contraction timelines have been felt in a sustain manner over the long planning and construction phases of these hydroelectric projects and their effect on the affected communities. Many of these conflicts have arisen from the narrow opportunities for input and negotiation between the various community stakeholders in these projects. These events also serve as a mean for studying the effects of water management policy and the type of governance that has been developed over the limited water resources involved. The analysis of these conditions is also a convenient vehicle to examine

and frame the positions of other stakeholders such as government entities, industry groups and other actors in the evolving challenge for water management policy (Chhotray & Stocker, 2009: 23), governance frames these issues by recognizing the complex architecture of government. For example, in practice there are many centers of power and diverse links between agencies of government at neighborhood, local, regional, national and supranational levels. In turn, each level has a diverse range of horizontal relationships with other government agencies, privatized utilities, private companies, voluntary organizations, and interest groups.

It is clear that the struggle for water management and governance has resulted in diverse strategies by the government, advocacy groups, and others competing for that precious resource. These conflicts have regional characteristics as the protagonists of water struggle to better their positioning in the conflict for control. These struggles denote strategies organized as social covenants that ultimately results on social change. As a consequence, the conflicts on the construction of the Zapotillo dam can be viewed through the context of the Advocacy Coalitions Framework (ACF), and that the nature of stakeholders involved in this process motivates to them cooperate and collectively attempt to influence public policy based on their real or perceived covenant for social change via public policy (Sabatier, 1988). The internal factors of a given coalition have tended to be determined by the learning curve for political action of the coalition's membership. Members of a coalition often begin at different stages of political awareness and their degree of involvement in the coalition may depend on other factors such as membership in an affected community, institutional and personal resources, their daily life experiences translated into the adaptive behavior, compromise, and/or points of involvement in the political activity of the coalition. This shows a special character, as these daily routines and habits influence the development and implementation of their strategies to affect their concerns.

The process obviously involves many variables such as social class, education, psychological deposition and past experiences. As previously noted, the effect of these variables can be seen in the attitude adjustment, compromises, and/or growing political sophistication and strategic position learned through their very involvement in the attempt to influence public policy on a specific issue such as water management. In this process, the central thesis of the ACF model for changing public policy becomes apparent as well. The ACF notes that change does not solely rely on external factors to the politics and politicians involved in the decision-making process, such as advocacy groups and campaigns, but also on internal factors in governmental and political institutions. Both of these forces are part of an internal potential for change within the political structure(s) being affected. In these process, the institutions undergoing change include other stakeholders such as congressmen and the internal dynamics within government. This process may lead to change (Roth, 2006 p. 169) and such a scenario concerns not only institutions and policies targeted for reform, but also the political communities' advocacy

coalitions and other stakeholders. Sabatier (1988) defines these change agents as individuals with different agencies, politicians, political parties, investigative bodies, the makeup of a system of shared beliefs and values and a set of shared assumptions, perceptions of a given problem that in turn, experience a degree of coordination of activities and strategies that shape the response to a specific issue. The positions, strategies, and actions of all these stakeholders ultimately determine the resolution of some issues. These variant political communities often constitute a subset or subsystem of political activity and positioning, allowing attempts to form coalitions. It is noteworthy to clarify that these coalitions are dynamic by nature, as the interest of a given group are subject to change or evolve to address the actual results of their actions and their effectiveness about actual political and policy changes.

The interest of this chapter is to provide a methodological framework for the political analysis of water conflicts, based on the study of types of coalitions and networks constructed by social and political actors, emphasizing the interests and values in the struggle and in the opening of the public policy in Mexico. The focus given to the Zapotillo Hydroelectric dam project allows to examine and analyze how these forces forge coalitions, political networks, and ultimately public policies. This research is also based on the review of the gradual changes in the building and the operation of the dam brought to the affected communities of La Presa (Los Altos de Jalisco, Temacapulín, Acasico and Palmarejo, Guadalajara city, León city). Three primary perspectives emerge from our research: First we will summarize the work of the planning process for the construction and operation of the Zapotillo dam and the Zapotillo - Leon, Guanajuato watershed Aqueduct, and the conflicts that arose from this planning phase in the project. The political network that resulted from the planning process will also be summarized. The second perspective will emerge from our analysis of the various coalitions that evolved around the conflict(s) in the building and operation of the dam, using sociograms as a tool to shed light on the perspectives, strategies and actions of the stakeholders, their often emergent self-interest position, and the role subject matter experts played in this real time scenario. The third perspective of the coalitions identified at the beginning of the debate over the water management issues in our chosen area of inquiry (the Zapotillo dam) will be analyzed.

Framing the opposition to building the Zapotillo dam and aqueduct and the resulting political network

Origins of the conflict

The opposition to the Zapotillo project takes roots in local opposition to the hydroelectric infrastructure projects planned by the Federal Government and the government agency (known as CONAGUA). The agency proposed the development

of a hydroelectric project that primarily impacted the ''Los Altos" region and three particular communities (Temacapulín, Acasico y Palmarejo) in the municipality of Cañadas de Obregón. The goal of the project was to supply the city of Guadalajara in Jalisco state with a source of drinking water and, in 2005, to divert the water from the Rio Verde for use in the city of León in Guanajuato state. In subsequent, twelve years opposite to the project having taken on many nuances and colors that can be summarize by two items that emerged from the many discourses delivered by the stakeholders: 1) Those in opposition to the dam because of decanting or transfer of water; 2) Those in favor of the dam if the government guaranteed no water will be diverted from the Rio Verde. Those who organized and mobilized against the building of the dam and aqueduct have, at times, taken both a national and international dimension, often intermittent and without continuity. However, the stakeholders that have come in and out of the opposition to the dam have created a movement against it; the juncture of this fragmented position has managed to stop the construction of the dam at 79.7 meters as of 2017, substantially short of the 105 meters height required to complete the project as the State's government initially requested for.

The stated reason for building the Zapotillo dam and the Zapotillo - León, Guanajuato Aqueduct is to secure drinking water for the region, resulting in 8.6 m^3/s of water (the distribution of the water will be as it follows: León 3.8 m^3/s, Altos de Jalisco 1.8 m^3/s, and Guadalajara 3.0 m^3/s). This water however, has also been targeted to support the industrial needs of The City of Leon Guanajuato and the ranching and forestry interest in the "Los Altos" region. Among the many factors coalescing the opposition to the Zapotillo dam is the flooding of three historic communities (Temacapulín, Acasico, and Palmarejo). The community of Acasico accepted a relocation proposal submitted by the federal government at the beginning of the project. Temacapulín has never wavered in its opposition to the project and has engaged stakeholders in a complex community-based effort that has involved the local and regional press, as well as digital networks and social media. These community-based efforts have become mediating factors between the community and the federal government as the community has forged international alliances and has secured the direct support of churches, universities, advocacy groups and other domestic[1] and international interests.

Plans to build a dam to supply drinking water for the city of Guadalajara were developed in 1941. However, it is not until 2006 that an agreement to build the dam is signed between the federal government and the state of Guanajuato, in order to build the Zapotillo - León dam and aqueduct. In 2007, the memorandum of understanding and mutual aid is signed by the federal government and the states of Jalisco and Guanajuato, resulting on the construction of the dam to a height that

1 These are social organizations with a special goal, geographically defined, usually of social claim.

increased from 80 meters to 105 meters. Currently, the Zapotillo project is included in the National Infrastructure funding for 2014-2018 and is listed as a priority for the state of Guanajuato in its 2017 goals.

As part of the development initiatives lead by Sistema Intermunicipal de los Servicios de Agua Potable y Alcantarillado de Jalisco (SIAPA) - System of Intermunicipal Water and Sewage of the district of Jalisco - and the State commission for drinking water of both Jalisco and Guanajuato, the creation of private public partnerships in the funding of water and sewage districts as well as distribution systems have been prioritized. These private investors represent a new schema for the management of water resources and have introduced a new set of variables to this development process, as these private investors have secured commissions and other investment instruments to secure potential profit margins and to protect their financial interests. This new governance and development dynamic has faced opposition from civil society in Guadalajara. A particular note in this conflict is that the aqueduct is being financed primarily with private funds from the Ranching Consortium (59.6% from the consortium and 40.4% from the National Infrastructure Fund). These type of private-public partnerships have a poor success rate in the free Water Resources market in Latin America and are, therefore, viewed with deep suspicion and distrust by community and civil society stakeholders and their allies.

Sustain Opposition to the project: Judicial efforts for Resolution and the Stakeholders

A major factor in the continuance of opposition efforts to the project and its relative successes has been judicially reviewed. The mobilization of stakeholders has resulted on judicial review and judgments favoring the opposition at various levels and courts. These legal efforts have been well funded by contributions from both regional and international supporters. The first law suit was filed in 2005 and brought the conflict to the public's attention. The case has moved through courts since 2008, resulting on appeals (both individual and collective) and constitutional disputes[2].

The first judgement or finding against the binding contract processes and content was rendered in December 2008 (Case files 2244/ 2008, 2245/2008, 2261/2008 y 2262/2008). Since 2010, several other individuals have filed for

2 An "Amparo" is a means to protect people against general norms, acts or omissions by the public or private authorities, and it's intended to safeguard fundamental rights and assumed as a means of constitutional control. While the constitutional controversy refers to a process followed by the Supreme Court of Justice of the nation that derives from a grievance produced by a general rule or an act, and only the federation, the federal state authorities and the municipalities can present it. (Political Constitution of the United States of Mexico, articles 103.105 and 107).

injunctions against the project and over 80 individuals have filed law suits seeking specific injunction to stop the project. In 2011, the courts decided in favor of the affected communities citing fundamental rights violations, and it ordered the project to be cancelled. The judgement also granted a temporary injunction halting the construction of the dam at no more than 80 meters height, and it stated that the original blue prints for the project should constitute the construction guidelines. In 2012, a constitutional dispute arises to the Mexican Supreme Court or "La Suprema Corte de Justicia de la Nación "(SCJN) (Expediente 69/2012), filled for the city council of Cañadas de Obregon, claiming an invasion of competitions in relation to the change in land use since the work was built without municipal permits. By 2014, the civic advocacy association "Salvamos Temaca" also files a successful suit, claiming that the authorities had failed to comply with SCJN's order of the constitutional dispute 93/2012[3], as well as having kept moving on with the construction of the unauthorized project, ignoring the rights of the affected communities.

In November 2015, the Supreme Court of Justice upheld a lawyer court's ruling (for Jalisco communities) that halted the construction of the Zapotillo dam at no more than 80 meters height (File 3/2015). In October 2016, the SCJN approved the construction of the aqueduct, the final portion of the Zapotillo project, although its possible effective operation has been stopped for the time being. However, the construction of the 140 kms aqueduct is being completed by the Spanish firm Abengoa since May 2016. The Zapotillo dam is scheduled to be fully operational by 2018, according to the official media. Lastly, the León Guanajuato Projects and Programs entity schedules the macro circuit channeling of the water from the Zapotillo dam for the 2015-2018 cycle, with its cost estimated at 6778 million pesos and counting. The Ranching constrain is comprised of companies such as Isolux México, S.A. de C.V.; Corsan-Corviam, Construcción, S.A.; Ayesa Ingeniería y Arquitectura, S.A.U.; Ayesa México, S.A. de C.V. (DOF, November 16th, 2012's binding process decision).

Our review of the events surrounding the Zapotillo dam clearly shows that the conflict resulting in the "back and forth" assertion, claims and counterclaims of both side of the conflict has created a regional conflict affecting the productivity and prosperity of the Altos de Jalisco region, the city of Guadalajara Jalisco, and the city of León Guanajuato, the destination location of the Rio Verde transfer. The issues arising from the changing water locations to these stakeholders has aggravated

3 This requires the invalidity of the coordination agreement concluded by the Federal executive, through the Secretariat of State for the Environment and Natural Resources, driven by the National Water Commission, for its acronym CONAGUA, and the executives of the states of Guanajuato and Jalisco, to carry out a special program for the studies, projects, construction and operation of the Zapotillo dam and Aqueduct Zapotillo - Altos of Jalisco - León, Guanajuato, subscribed on the October 16th, 2007, among others, by the Head of the executive power of the state of Jalisco, C.P. Emilio González Márquez and other authorities defendants.

the political tensions between the cities of Guadalajara and León, as the struggle to adjust to the percentage of water available. The Guadalajara concession will substantially be provided with a lower percentage of drinking water which would be directed to meet the needs of León based industries.

The rise of a social movement in the Jalisco's water resources management

The opposition to the Zapotillo dam, as previously noted, is rooted in the collective community reaction to the project in the affected communities scheduled to be flooded as a result of the dam's construction. Although a grassroots movement in essence, the communities' stakeholders have been highly influenced by their regional and international supporters. These supporters have made it possible for the opposition movement to continue playing a long-term role in this region conflict. Specifically, they have provided financial backing to judicial filings, mobilization efforts, and financial movements.

In May 2014, from the outskirts of the opposition movement, seemingly out of nowhere, emerged the Observatorio Ciudadano para la Gestión Integral del Agua para Jalisco (OCGIAEJ)[4]. This group was viewed with suspicion and seen as a government sponsored puppet group whose goal was to infiltrate the legitimated grassroots organizations and opposition movement. The Observatorio has strategically managed its membership key positions and has at times influenced coalition decisions in favor of the state. The Observatorio members have been identified as key players in the government's ability to influence community groups in the decision-making processes on water management in Jalisco. These views of the Observatory group have led many community members to challenge the legitimacy of the groups, its leadership, and its role in the opposition movement. They are seen as obstructionists in the legitimate opposite movement rooted in the affected communities and as a government appeasement factor in the opposition. The observatories rise to power and influence within the Opposition movement began at the local level in the Altos de Jalisco Region and organized around the interest of the Rangers and Forestry concerns without actual knowledge of the consequences of building the dam and aqueduct on the local communities' soul and the judicial solutions previously noted. It is also noteworthy that although the Observatory membership has engaged with other stakeholders in the conflict over the Zapotillo project, it has not engaged the "Salvemos Temaca" (Save Temaca) coalition. We will examine the changes in leadership and membership in the opposition coalition against the Zapotillo project.

4 Technical and Citizen Collegiate Team, specialized in water matters to formulate opinions, rulings, proposals, technical and legal criteria, and recommendations, all of them of a public nature, oriented to promote informed and reasoned Management of water resources in JALISCO (art. 1 of the OCGIAEJ).

The opposition to the Zapotillo dam and Aqueduct as a Political Network

A complex net of institutions and organizations

The political network that has been organized around the stakeholder's civic involvement in the conflict over the Zapotillo dam has resulted in direct activism that has affected the social fabric of the affected communities and the region. An example of this activism is the civil society organization, Salvemos Temaca, whose explicit goal is to save the Temaca community from being flooded, and the Observatorio council. Experts on the matter, such as the Lawyers Collective (Colectivo de Abogados) and the Lawyer Alejando Lopez of the CONREDES network, have been key members of this network. Other experts from academia have been key in media relations and in exposing the issues of water management in public and private Universities. Their work has influenced and gained support for the issue locally, nationally, and some contend internationally. The political network is largely sustained by and involves 20 institutions membership in the Observatory coalition, including:

- Universities: Universidad de Guadalajara (UdeG), Instituto Tecnológico y de Estudios Superiores de Occidente (ITESO), Universidad del Valle de Atemajac (UNIVA), Instituto de Astronomía y Meteorología (IAM), Instituto de Limnología del Centro Universitario de Ciencias Biológico Agropecuarias.
- Los Altos Region: Diócesis de San Juan de los Lagos, Consejo Regional para el Desarrollo Sustentable (CONREDES), AC., Foro ganadero de Jalisco, Silvicultores de los Altos, A.C., Asociación de Avicultores de los Altos, Porcicultores de los Altos.
- International Members: Fundación Nueva Cultura del Agua (Zaragoza, España), Universidad Complutense de Madrid (área de Geohidrología).
- Guadalajara-based Institutions: Fundación Cuenca Lerma Lago de Chapala-Santiago, A.C, Parlamento de Colonias de la Zona Metropolitana de Guadalajara, A.C.
- Other institutions supporting the Zapotillo dam Process: Consejo de Cámaras Industriales de Jalisco (CCIJ), Cámara Nacional de Comercio de Guadalajara (CANACO), Consejo Económico y Social de Jalisco (CESJAL), Consejo Técnico Ciudadano, A.C, Centro Empresarial de Jalisco, S.P. (COPARMEX).

These institutional members make the consortium an important local instrument in terms of its potential for influencing political action. The makeup of the Observatory as an institution is noteworthy, particularly due to its weight within internal debate of the Altos region members in the subsequent actions and strategic positions this coalition has taken. The power of the Altos members has been questioned by other members of the coalition and has led to internal debate of the

advocacy and public assertions of the coalition. The government has also indirectly participated in the political network via efforts of CONAGUA, the Jalisco state government, and the Jalisco counties/municipalities of Guadalajara and Cañadas de Obregón, since these institutions have been in constant communication with many stakeholders, especially the president of the Observatorio Coalition.

Equally important is the political network that has been developed around the opposition to the Zapotillo Project and the legal defense and advocacy efforts of the affected communities. These are the Salvemos Temacapulín Association, Acasico y Palmarejo committee, The lawyers Collective, The Mexican National Committee of those affected by Dams and the defense of Rivers (Movimiento Mexicano de afectados por las presas y en defensa de los ríos MAPDER), The Mexican Institute for community Development (el Instituto Mexicano para el Desarrollo Comunitario A.C. IMDEC), and the Absentee Sons of the Club Temaca. These stakeholders have lead the opposition to the Zapotillo dam, particularly in the seeking of a Judicial Solution to the conflict: the attention of the opposition to the project at the local regional, national and international levels; media advocacy and press conferences; social media; alliance both formal and informal with international water rights advocates and institutions; fund raising efforts to mobilize advocates against the dam.

Los Altos regional groups, such as the Civic Association for the Defense of our water, have recently joined the political network against the Zapotillo dam. Such groups have been organized by the Altos region trade groups and business interest. Their involvement is significant since they have solidified the opposition to the aqueduct portion of the project because of the uncertainty the project brings to those properties and businesses bordering the project. Also, at stake for these groups is the water allocation and distribution from Jalisco state resources to the Leon Guanajuato Industrial base. In particular, these groups fear a cost increase for water usage and a decrease in water resources for the region.

An important segment or subgroup of the opposition network is the role journalists have played in this conflict. Especially noteworthy are the efforts of Agustín del Castillo, whose tireless efforts have documented the opposition and the conflicts of interest in various media outlets such as local Guadalajara based newspapers, his own blog, and other independent traditional and digital media. Others working in this sector include the journalist association "¡Tómala! Un golpe de conciencia" whose consciousness building efforts have galvanized other civilly engaged organizations. In addition, there is the work of the "Cronica de Sociales" journalistic effort to chronicle the work of advocacy groups working in Jalisco. The presidents of these two organizations have played a vital role in publicizing the efforts of the opposition groups to the Zapotillo project. Another layer in this subgroup are the international organizations such as The Network against Latin American Dams (Red Latinoamericana contra Represas) and International

Rivers (Ríos Internacionales). These organizations have helped bring international attention to the Zapotillo dam conflict opposition. For example, "International Rivers" organized local community forums in the Temacapulín community that attracted local, regional and international concerns. From these community forums, the catholic priest Padre Gabriel, has emerged as spokespeople for the opposition efforts in the communities of Temacapulín, Acasico and Palmarejo.

Our study of the Zapotillo conflict undoubtedly found that civic engagement by members of civil society has played a vital role in defining the "rules of engagement" in the political process for both opponents and the proponents of the Zapotillo dam project, the forming of coalitions to advance the individual positions of coalition members and their interests. The individual and collective goals and incentives motivated stakeholders to engage in this issue and has not prevented dialogue and genuine debate between stakeholders who have drastically different points of view. Their dialogue has resulted on a genuine effort to find a democratic solution to the conflict over water management and usage that can potentially extend beyond the Zapotillo dam conflict. Their interactive efforts have led, in spite of the view of some members of a given coalition, negative view of the opposition to the possibility of mediation and compromise over the issues that arose from the Zapotillo Project. These efforts have challenged the status quo of the government power, business interests and their power, and, in particular, the individual power that some members of the Observatorio Coalition have acquired.

The relational capital of the Network

To analyze the socio-political dynamics of the Zapotillo dam conflict, we interviewed 23 key informants. We reached a total of 39 potential key informants for this study. Our research identified three coalitions: 1. The Conservative Coalition working to oppose the project, 2. The Pro Growth Coalition working to support the project, 3. The Historic Preservation Coalition working to oppose the project as a community preservation effort.

Based on Roth (2006: 177), it assumes two poles of the coalitions: A productivist one and a conservationist one. The first pole is characterized by considering as a priority the economic growth and the increase in the standard of living. While the second one fights for the preservation of flora and fauna, and is concerned about the degradation of the natural environment caused by industrial and agro-industrial growth, such as the felling of forests, the consequences of intensifying the productivity of the soils, the use of fertilizers and pesticides, industrialization, pollution of the rivers, the infrastructure works, and the energy and increasing urbanization. The historic coalition refers to the actors who have established legitimate and legal mechanisms of resistance to the conflict originated. And that, by its lengthening in the network of actors, have supported important

legal changes, including a professionalism in the management of conflicts. In addition, they are part of the legitimating side of the defense.

The conservative coalitions are organized around the preservation and stewardship of natural resources and the degradation of the environment once the dam became operational. They have also lead the debate over the loss of cultural and historical assets and traditions that will be affected by the Zapotillo project, specifically the flooding and subsequent displacement and relocation of these communities. The Pro Growth Coalition has focused its advocacy around a real possibility of economic growth, particularly in the Guanajuato region. They advocate that the economic stimulus the dam and aqueduct represent to the region will improve the quality of life for the area residents and affirm that the overall benefits of the project superseded the damage to the environment and the exploration of the Rio Verde waterway. Since 2014, The Historic Preservation Coalition has had intermittent contact with the other two coalitions. They have been key proponents and activist against the project and have garner much of the outside attention for the Zapotillo dam conflict. They have also played a major role in limiting the height of the Zapotillo dam to 80 meters, therefore mitigating the environmental impact of the project and subsequently triggering debate over the allocation and management of water resources and the possible conflict of interest within the public-private partnership financing the construction of the dam. The coalition legitimating community advocacy truly represents the cultural, economic and historic interest of the affected region.

The density of the political network that has emerged from the Zapotillo dam conflict represents a level of high connectivity *(Cf. Figure 4.1, p. 411)*. The coalitions had frequent and meaningful interactions, especially with the Observatorio president Juan Guillermo. These interactions have shaped the actions and modalities for all these coalitions, particularly technical support, information sharing and analysis. The peripheral stakeholders, according to the key innermost interview are members of the very institution that must be involved in the resolution of this conflict. Amongst the institution named as a key power broker is the CONAGUA Utility. Ironically, this institution has not interacted at all with the political network in question.

The centralization of the Zapotillo dam political network shows how coalition members are directly connected to each other. In the case of the Observatorio president, he is highly connected to all stakeholders due to his high visibility role and the power of his coalition. Therefore, his ability to come and go between the various coalition and their clusters is higher than any other stakeholders. Other stakeholders including Padre Gabriel, María González (executive director of IMDEC), Guadalupe Espinoza and Claudia Gómez of the Lawyers Collective also have high connectivity with the majority of stakeholders in the network. Padre Gabriel in particular has a high degree connectivity and importance due to his legitimate connection to both community groups and international supporters. Of

particular importance is the role he played in the early stages of activism and the international support he generated. The Lawyers Collective has obviously played a key role in the successful judicial advocacy efforts. Given the roles of the Observatory president, Padre Gabriel and the Lawyers Collective in the political network, it is not surprising that other stakeholders have luster arraign these three individuals and the institutions they represent. Many of the other stakeholders see these key players as vital to their inter stand. Although there is often little connectivity and or communication between them, they are able to connect around shared interests.

It is also noteworthy that the most active community stakeholders such as the Juárez family of the Temacapulín community, and Mario López (the representative of ITESO in the Observatory) have important connections and relationships with many other stakeholders, especially among academics and advocacy organizations. The significant role that the Juárez family has played in the Historic Preservation Coalition since its conception gives great legitimacy to their concerns and their ability to represent community concerns. Padre Gabriel (Temacapulín), María González (IMDEC), Guadalupe Espinoza and Claudia Gómez (Colectivo de Abogados) have the highest degree of mutuality (betweenness) and connectivity as a subgroup *(Cf. Figure 4.1, Sociogram of the network based on relational capital, p. 411)*, versus Juan Guillermo (Observatory President), who has the most pathways to connectivity with all other stakeholders (closeness).

Our research also documents the sustain resistance by the Temacapulín town to their forced relocation. Their resistance and opposition has generated several regional and international advocacy and support networks which help financing and allowed the continuance of the opposition movement to the Zapotillo dam project. In addition, resistance movement led by the people from Temacapulín has developed alliances with other community-based movements elsewhere in Mexico. They have evolved into an effective advice group for other related issues, such as land management and environmental protection. Since their inception as an advocacy coalition, the people of Temacapulín have had direct support from the Hijos ausentes coalition, IMDEC, COA, and various blogs on social media, traditional media outlets, and journalists, as well as other institutional supporters at the local, national and international level.

Their visibility translated in support from these various entities has, as previously noted, gained resources and facilitated opposition efforts. At the same time, because of their visibility and advocacy campaigns, the people of Temacapulín have been supported by politicians seeking votes in constituencies that support the anti-Zapotillo dam advocates. Their advocacy has dynamically engaged caravans, MAPDER, academics, international networks and has allowed them to sponsor public events, forums, fund raising campaigns and many other actives that have contributed to their sustained presence and leadership in the opposition movement to the Zapotillo dam and prevented their relocation and

the flooding of their town. It has also had a legal efficiency throughout their engagement with the Lawyers Collaborative and their successful arguments before the nation's Supreme Court.

The Observatorio Ciudadano para la Gestión Integral del Agua para Jalisco is an important local instrument, of which its importance in the anti-dam coalitions is clear. They continue to advocate for the interest of the Altos de Jalisco region and continue to maintain and cultivate allegiances with civil society. However, their role beyond that region is not as significant as it seems, as evinced by the 120 recommendations the group has made that have not been acted upon by other members of the Opposition, until May 31st, 2017. Furthermore, even though the Temacapulín community is part of the Altos region, it is not a member of the Observatorio. In recent efforts to form alliances with other coalitions and individuals, the Observatorio's president has managed to enjoy some success with some stakeholders from Temacapulín and has continued to garnish support amongst academics at ITESTO and the University of Guadalajara.

This network analysis gives us a glimpse behind the organized efforts of the coalitions that constitute the political network that has emerged from the Zapotillo dam conflict. The maneuvers and strategies behind many of their actions had little to no accountability in their opposition to the status quo and were largely centered around an anti-system mentality. This scenario may possibly lead to a compromise solution, particularly in light of the historic preservation coalition's more conservative approach and the radical solutions proposed by the pro-growth coalition. They have compromised, given how the historic preservation coalition has used the media (social and conventional), as tools to maintain their visibility and relevance in any solution to the conflict. Their mobilization around the issue of water management and the agenda they have put forth has driven the debate for all three coalitions (both publicly and privately). For example, human rights and their relation to water management and usage have been cited by all three coalitions and have driven the debate locally, regionally, and internationally.

The Role of Experts in the Coalitions

In spite of all the political and judicial solutions seeking to resolve the Zapotillo dam project conflict, the dispute continues and seems far from resolution. In November 2014, perhaps in resignation to the impasse, the Jalisco State Government in collaboration with the Federal Government, sought help from the United Nations Office of Projects and Services (UNOPS) for the resolution of the conflict. UNOPS was engaged to conduct technical studies on the viability of infrastructure projects on the Rio Verde[5]. Their work was completed in May 2017. The results of their

5 Abbreviated designation: "Jalisco Sostenible Cuenca Río Verde" Project 00096599.

studies have not been released yet and, as we wait for the government to propose the type of negotiations they are willing to participate in, the financing of the aqueduct has been approved and thus adding to the great uncertainty that this project has created for the region. Facing incertitude, experts have added their voices in opposition of the Zapotillo dam and Aqueduct Project, helping to mobilize both individual and institutional stakeholders. The UNOPS studies are seen by some as both a counter-measures to the "expertise" from the opposition side and as a neutral arbitrator to the conflict.

The role of experts in this conflict has obviously been an important component, particularly as many of these experts have become part of the three coalitions and their advocacy. There are five types of experts: law, education, engineering, development and political experts. The experts' role has become more integral and reoccurring in the coalitions as individuals representing organization participate in the coalition's work. These individual skills and expertise have influenced and supported coalition efforts, especially those in executive director roles and or those with skills set in a particular industry or enterprise relevant in the conflict, as Mario López (ITESO Coordinador), María González (Director of IMDEC), Enrique Romo (Businessman and Pro-growth Activist), Luis Antonio de Alba (Ranger and Land Owner) and Manuel Villagómez (Executive director at the Lerma Chapala-Santiago Foundation). The Executive director at IMDEC should be noted as a specially important expert/stakeholder of financial, technical, and analytical expertise, who has truly helped to mobilize the communities affected and hassling a genuine clear voice to the Historic preservation coalition in opposition to the Zapotillo dam conflict.

The experts have been a vital component of the viability, sustainability and relevance of the opposition both as a political network and as a public societal debate over the usage and management of water resources. In particular, they have led, funded and promoted the concept of a judicial solution to the conflict. The lawyers' collective led by Alejandro López, and their work with the Advocacy group CONREDES, have been of particular importance. They are members of the same coalition, yet it is noteworthy that they have chosen to not directly engage with other experts. Instead, they have connected with others through the most relevant stakeholder, (by measure of interactivity with others), Juan Guillermo of the Observatory. We have also observed that the law and engineering experts tightly coordinate strategic actions within the coalition. The "political experts" tend to be journalists and part of the conservative coalition. Héctor Castañón (¡Tómala!), Yariel Salcedo (Crónica de Sociales), and Agustín del Castillo (A journalist working in a local newspaper) are amongst the most active ones. We have observed that these stakeholders do not directly connect with each other.

We have also identified the social characteristics of the expert class participating in the coalitions *(Cf. Figure 4.2, Sociogram of the experts in the network, p. 412)*. They are mostly professional and five of the experts we interviewed hold doctorate degrees.

All of the "Experts" in the advocacy network have advanced degrees except the executive director at the Lerma-Chapala-Santiago Foundation. Their professional standing and credentials allow these individuals as members of profession networks to easily link with other similar professionals at the Universities, and other academics, as well as National and International entities. We have also found that the majority of these experts had previously established links with International Institutions. For example, the president of IMDEC was able to secure funding for her work in Temacapulín from the Rose of Luxembourg Foundation.

On the other hand, the Sabatier's (1988) hypothesis for coalition biding argues that stakeholders tend to coalesce around those holding similar belief and values. Yet, in this instance, we must ask if the academics and the Altos de Jalisco pro-growth coalition members hold similar values while they clearly hold similar credentials and professional standings. Do local elites share their values and priorities with national and international elites? At this juncture in our analysis, we can assert that the preeminence of interest exceeded in importance. Amongst the actors in the society, there are three expert groups prevailing: engineers and other technical experts, the lawyers and the journalists, as well as the social media bloggers.

In general, the majority of stakeholders interviewed have a clear understanding of the conflict over building the dam. Some have actively documented the events, especially the views of government stakeholders in the mass media outlets and electronic newspapers, such as Facebook and blogs written by experts in the matter. It currently seems that the experts with the greatest influence over coalitions are the technical experts such as engineers, scientists, development planners, and others with professional expertise. It would appear that these individuals have the greatest influence because Juan Guillermo of the Observatory holds an engineering degree and often presents his arguments and contentions from a technical perspective. He, therefore, is able to engage other technical issues and has used this strategy to position himself as a key stakeholder and voice in the political process and decision making. He tends to function more prominently in the Conservative coalition and as a representative of regional forestry interest of Los Altos.

Stakeholder's orientations

As stakeholders position themselves politically, they also play an important role on environmental protection and water management. Sometimes, most stakeholders declare themselves pro-agriculture. Only two stakeholders have asserted their position as sole focused on water issues. We have observed that the historic coalition lost power within the Observatory (as they shifted their mobilization tactics to a more populist approach). This loss of positioning is linked to Juan Guillermo. As the Observatory leader began positioning himself as a spokesperson and influential technical stakeholder, particularly in Los Altos base groups and interest (Forestry

Ranging/Husbandry, farming), he emerged as the primary leader of the Opposition movement to the dam.

Nevertheless, as of 2015, stakeholders defending the Temacapulín community have been able to implement several very successful mobilization campaigns against the projects of the National Water Commission. These efforts have cemented their leadership role as a strong legitimate voice and a strategic and logistic leader in the opposition to the Zapotillo dam and Aqueduct project. Therefore, it is extremely unlikely that they will be pushed out of their leadership role in the opposition movement. The interests of the highly productive region of Los Altos de Jalisco (conservative coalition) are also not going away. To maintain and expand their productivity, they will require a large volume of water. It is not in their interest to divert water away from the region and/or the region getting less water from the project.

The interests of Leon Guanajuato are another pain point into the conflict. Their multiple interests are complex and well founded, particularly in light of the strong support from the federal government making a strong argument for the water needs to León's industry. The needs of the Tanneries and related industries such as Shoe makers, leather goods manufacturers and others that are the historic economic lifeblood of the León Region, will continue to have government and business leader support. The growth of the León metropolitan area and the urbanization efforts surrounding it are directly tied to the Tanning industry. The industry, according to the findings of SAPAL, has been guaranteed 25 years access to water from the Zapotillo dam Project. In this environment *(Cf. Sociogram 4.2, p. 412)*, it is obvious that competing interests are facing a complex and difficult impasse. All these interests and their constituencies have both legitimate claim to water, and legitimate well-defined needs such as water for industrial use, drinking water, environmental preservation, etc.

Our analysis of how different stakeholders in the Zapotillo dam - León Aqueduct conflict see themselves and are perceived by others is seen through the lance of the management of water resources. The position emerges from true local needs and encompass other issues, such as environmental protection, water markets and pricing, and other dilemmas. These issues are focused on how the government (Local, State, and Federal) manages the needs of these competing interests.

The period during which the Zapotillo Project grew in importance has, whether by societal mobilization or consolidated legal efforts, brought to light and into the people's consciousness vital issues and needs. For example, in the period of 2011 to 2017, pertinent international Treaties regarding water have been reviewed. Other factors such as the human rights matter, water rights and management have become a vital component of the debate. The fundamental characteristics of water usage debated surrounding the Zapotillo dam have not changed. However, research shows changes in the perception of the issues surrounding this conflict.

The expected involvement in the debate of civil society, national and international stakeholders and grassroots community stakeholders has changed the nature of the debate. The political capital of these various interests has made this conflict much more relevant than the debate over water management would otherwise have been. This matter has brought to light other issues such as the public-private partnerships (Asociaciones Público-Privadas, APP) and their role in developing hydroelectric infrastructure projects, the role of elites and their position on this issue and other factors that may not have been discussed and examined without the Zapotillo dam issues taking on the dimension it has.

In framing the perspective of how stakeholders are seen by themselves and by others, we note that the vision of the Conservative Coalition is local in nature, in which they see the dam as a destabilizing force in the region both socially and politically. They also attest that the dam will also destabilize the water market and create pricing issues. Other stakeholders see their efforts as part of a worldwide debate about water management issues, the environmental impacts that hydroelectric projects have on the environment, and the displacement of people and communities. They clearly see water management as a worldwide challenge, and have brought to the debate an international perspective to position their arguments and resources within this context. Their intention was strengthened by the participation of international stakeholders such as the Spaniard Pedro Arrojo, who had a big legitimacy for his non-political character, which gained in weakness since his election to the Spanish Parliament in 2016 and his relocation to Madrid. (He was an international representative on the Observatorio Ciudadano de Gestión Integral del Agua in Jalisco).

The sociogram illustrating stakeholder's perceptions (Figure 4.4. *Sociogram of the actors' perceptions, p. 414*) also shows that the stakeholders in the conservative coalition have a global perspective. They are aware of the modalities within the environmental debate and their local input. They see the relationship between water management issues and global climate changes and are very much aware of the national and international regulatory bodies involved in the water management and development sectors. They have a local perspective, but they also are fully conscious of the fact that any solution to the Zapotillo dam issue will involve international concerns and perspectives. On the other hand, stakeholders in the pro-growth Coalition (Carlos Valencia, Enrique Romo and Luis del Valle) assume that international concerns are part of the debate, but the resolution of the Zapotillo dam conflict must be prioritized around pro industrial growth schemes balanced by the rule of law. The historic preservation coalition also sees themselves as active participants in the various levels of local, national and international solutions to the conflict. However, it is their contentions and strategic position that any solution to the conflict must first meet the needs of the communities affected. They contend that the community needs to have the most weight

in this debate. They also argue that they know the needs of the region and its people better than any other stakeholder, and, therefore, that their voice is vital to any resolution to the conflict. They acknowledge the role of the judiciary and the rule of law as a framework for a solution, but put forth the notion that local decisions must carry more weight. They fully recognize the importance of the legal framework that will lead to governance and the resolution of this conflict. They also acknowledge environmental protection, long term water management and international regulations, political and social concerns, as well as human rights, but contend and advocate that all of these factors must be viewed through a locally based perspective.

In our analysis of the various stakeholders' perspective within each coalition and their relative positioning in the debate and proposed solutions, some hold multiple positions and appear to be motivated to take this position due to their roles in multiple institutions and or groups. For example, the tuition stakeholders allow for multi involvement in the debate such as direct negations with other stake holders, mediation efforts, fund raising campaigns, as well as local, international, political and advocacy efforts. Another fact related to the multi position and involvement of some stakeholders are the skill sets of various stakeholders as they are related to the needs of their coalitions' efforts to mobilize and finance, and their ability to form alliances and links to other stakeholders and or coalition members. In the case of the Lawyers Collective, they have links to international lawyers and the interest they represent. Another example is the financial support that IMDEC provides to the Temacapulín community. Important factors in the Temacapulín efforts are the connections and support that Padre Gabriel has developed amongst academics at the local and international universities that have financed his personal appearances and efforts.

What all of the multi-positioning of stakeholders seems to indicate is that these stakeholders may not have much decision-making power. They are influenced by the various interests they are managing and, therefore, may not be able to make decisions. Some of these stakeholders, particularly those who have been key in keeping the Zapotillo dam project long term visibility in the public debate, may not be able to influence the decisions and mobilize resources of their partners in relation to their local needs and perspectives. Some of the efforts of these stakeholders are framed by their role as intermediaries between the mass media and their investment in the various means of communication and they propagate local, regional and international perspectives that may have significant differences in concerns and resources. Finding the proper positioning compromise between these many factors, slows down, if not prevents, decision-making for these stakeholders. Another factor worth mentioning is the relative closeness or relationship these actors have with each other, and the flow of communication between them. All of these stakeholders appear to have multiple means of communication with other coalition members both formal and informal.

The role of the Coalitions in framing Water Usage Public Policy: Tendencies and Perspectives

We have noted that during the length of the Zapotillo dam conflict, legal and institutional decisions have been the most dynamic factors in this debate. From the point of view of the ACF model, and gaining insight from this perspective, there is a way to help explain the political involvement and dynamic tendencies, since there has been no change in the socio-economic realities in the daily lives of coalition members. The government and its structures have also remained basically unchanged. However, it is clear that there has been a great radical regional awakening and shift in attitudes of stakeholders and their perception of regional needs. Perhaps the biggest factor in this conflict has been the resources of international stakeholders and their local and national allies. For example, the incorporation of human rights, sanitation, water rights into a regional water management dispute, as well as leading the opposition from seeking a judicial resolution. Their efforts have led to the review and, at times, invocation of international treaties and norms, judiciary issued protections and precedents addressing the issue of water usage for the entire Mexican Citizenry. The mobilization of entire sectors of society around the issue of water management forced the state to truly have a more transparent model for both policy development and governance. Protracted negotiation around the issues began in 2011 and culminated in a legislative solution: a law addressing the right to water. However, the implementation of the law has been slow, and it continues to favor judicial challenges and review, and a more general or rather less focused component of the debate over water rights.

We must note that part of the challenge is a disagreement over which institutions should be responsible for generating water usage public policy, and over the criteria to be used in the development of these policies. Issues of governance, jurisdiction over regional boundary line disputes are also part of the mix. The responsibility parameters regarding water policy among several government agencies and commissions is also an issue. In this environment, the pressure brought on the government around the Zapotillo dam conflict is a dynamic component of civic involvement that has brought about the possibility of policy and political change. The interest of the groups and individuals that were mobilized around the issues have led the way to a deeper examination and a greater opening for public policy indicatives and the expansion of social concerns. Those in opposition to the dam have led the way in a reinvestment and the human capital they represent must be underlined. Their involvement in the short term and their potential for long term involvement will create advocacy opportunities and means of addressing public policy concerns on many levels and for many issues. Their efforts have renewed civic involvement and have restructured the process for instituting and approving water use policy.

The outputs of the coalition reflect the interchanges and contacts between all coalitions and their membership. All the stakeholders interviewed for this study were referred to us by other stakeholders. We also observe that, the leading most active coalition is the Conservation coalition, that is to say that they have tended to dominate the debate against the building, development and operations of the project and that they have the longest history of opposition to the Zapotillo dam and aqueduct. It is noteworthy to underline the interconnectivity of many of the stakeholders in this coalition, especially the links between Juan Guillermo (principal stakeholder) to María González (IMDEC), Mario López (Académico of ITESO) and to Luis Antonio de Alba (another business leader of Los Altos de Jalisco).

Also noteworthy is the fact that, in spite of the political void between Juan Guillermo and Padre Gabriel, they appear to be in good terms with each other and very conformable in their respective roles as advocates and leaders within their respective coalitions. They are effective voices for their groups' concerns and they both enjoy a strong link to the Juarez Family and their allies. The Juarez family is very active in the historic preservation coalition, and although all of the stakeholders we interviewed mentioned the Juarez family and identified them as important stakeholders, the family appears to have very little to no connection to others interviewed. They maintain a pronounced distance from other stakeholders (excepting Padre Gabriel and Juan Guillermo) and the representatives of the Lawyers Collective (Guadalupe Espinoza and Claudia Gómez). The Juarez family was the first to mobilize against the dam in the Temacapulín community and their leadership role has continued through the conflict.

All stakeholders who were interviewed acknowledge the *Comisión Nacional del Agua* (National Water Commission) as part of the solution, for which they note that a successful initiative for the resolution of the conflict should originate from these institutions *(Cf. Figure 4.3. Sociogram of Policy Coalition Outputs, p. 413)*. They note that the role of Municipio de Cañadas de Obregón's government (site of the Dam) is important but not vital to the resolution of this protracted conflict, as the federal government has ultimate power over these matters. It is their hope and, at times, their demand that any solution proposed or implemented considers the views of the NGOs and the needs of the displaced persons, as well as those of the municipal State and federal governments. Another important notion in the opposition to the dam is the Clergy. Several stakeholders interviewed are members of this group and part of the Guadalajara Dioceses (such as Padre Gabriel). Padre Gabriel carries great weight in the mobilization and advocacy movements opposition to the dam. Another priest, Padre José Luis Aceves, has had direct contact with both state and federal governments, arguing that he is not against the dam, but against the water transfer.

Public policy has been driven by the values and interest groups to the stakeholders in the Zapotillo dam dispute. Their civic involvement has brought significant issues to light and has led to significant political and policy change. The

ACF model attempts to explain how these political and policy changes happen as a competitive process between the values of one group of stakeholders versus another. These groups have formed more or less formal coalitions based on shared values and strategies to best advocate for and make their arguments in favor of their perspectives and desire outcomes. The coalitions seek opportunities to manifest their positions, create a subsystem of supporters, advocate for their policy goals and objectives, and in this process, to learn the necessary skills to implement change (Roth, 2006). Based on our study, we have identified a set of tendencies toward a path's opening in public policy debate regarding water usage in Mexico. We based our observations on the analysis we have performed on the work of the coalitions involved in the Zapotillo dam and Leon Aqueduct dispute. These tendencies are:

Tendency 1: Land appropriation and dispute.

Stakeholders tended to have a strong base for their particular arguments and position based on a strong identification with their region and how land was managed and appropriated for the Zapotillo project. They mobilized around these shared values and ideates with their communities. Their advocacy efforts focused on land and community preservation and a genuine defense of their community and their homes. They were not necessarily concerned with the economic growth and the potential that project may bring, and were simply engaged in defeating their homes and way of life. Their indigenous identity with mother earth (Pachamama, or Gaïa) motivated their mobilization and advocacy efforts. Their collective action was rooted in a long history of communal identity and decision making regarding land use and other resources. The conflict generated a wave of community identity and pride and forced some to reexamine their territorial and cultural survival across Mexican history. For example, prior to the conflict, the community of Temacapulín had not highlighted their religious and anthropological importance. Their rented identity with their cultural past was based on artifacts found in the community that had religious and anthropological values. These objects helped them articulate the defense of their home and culture, and engaged other stakeholders in their struggle. Stakeholders who mobilized around their "Hometown" and their identity were also able to claim their ancestral past as an asset and looked for other institutional spaces, for the community to defend the values they stood for.

Tendency 2: Institutions of conflict resolution and trust builders.

A conflict is also the product of a structural policy view. How they cut or divide the specific policy initiatives they generate is a vital component of how these very policies will be perceive and implemented. Their attitude can balance power and social fabric of the communities and regions affected by the policies

the institutions generated, especially the natural and institutional resources involved in or affected by the policies enacted. This research shows the multiple means by which public trust can be affected, developed and promoted by how the different stakeholders, their interest and advocacy efforts are handled. It must be the goal of the policy-making body to engender the public in relation to conflict resolution and the stewardship of natural resources. Local judicial and social norms must guide policy makers as stakeholders to generate real public pressure in favor of their given position. They must act to resolve water usage issues, taking into account the evolving cultural norms and the legitimate concerns of the people they serve. Institutions must be an instrument of grievances address and inefficiencies, and should be seen as trustworthy independent public servants and policy makers.

In the different phases of the Zapotillo dam conflict, we have analyzed the emergence of distinct mechanisms for normative, regulatory, and institutional resolutions of the conflict. The first example of emergence was the 2005 Judicial judgement in favor of the community of Temacapulín. This judicial action was a precedent setting and the first of its type in the history of the court as it pertains to environmental issues. We also observed that the Observatory Coalition's emergence, in 2014, as a strategy of the Jalisco government, has paved the way to institutional changes. Curiously, some of the policies initiatives that have emerged from this body have been, at times, a counterweight against the Jalisco government. Currently, their role as a counterweight to state actions has evolved into the role of "witness" of the state's actions, as they pertain to the stewardship of water resources in general, and specifically the stewardship of the Zapotillo dam project.

Tendency 3: Judicial Judgements and findings.

Conflicts also make room for judicially actions. The judiciary has served as an anchor, and its courts as a forum for the advocacy groups that emerged from opposition movement and seek a Law expert to translate their work into arguments (Melé, 2006). The allies of these groups, both national and international, have advocated the notion that a judicial process is a means for independent arbitration and conflict resolution. Legal arguments, findings, judgments, and other mechanisms available to the judiciary, facilitated conflict resolution and propagated the laws and politics that emerge from judicial actions and review. Our study has shown that the opposition movements to the Zapotillo dam have bought time to develop their arguments in defense of their position each time the courts have ruled in their favor. On the other hand, these same rulings have allowed the Jalisco state government to strategize and legitimize their final argument in favor of the financing scheme for the dam project and the 105 meters height requirement that has been questioned by

the opposition. The involvement of international institutions such as UNOPS (a specialized body within the United Nations) have the potential to legitimize governmental action, even if at the present time, the courts have ruled against them. The role of the judiciary as a forum for debate and conflict resolution acts as a counter measure for those who attempt to delegitimize regulatory practices as well as community or legal arguments. The judiciary can address controversial issues and resolve conflicts between stakeholders, particularly those who framed water rights issues as Human rights.

Those who mobilized to defend the affected communities' water rights, have also advocated for a review of the water management and preservation's effect on the environment. They are very invested in this role and have enjoyed local support for their positions, and they also count on courts to legitimize their position. The court ruling validated their efforts and has vindicated their position as legitimate community representatives. The court's findings have put to rest the contention (by their opposition) that their arguments and positions were shaped by outside agendas and motivations, and not by local need. Much has been written by academics and other supporters of the opposition, documenting the effects of the Zapotillo dam project. Most of the time, these documents have no legal standing. Nevertheless, such findings have helped the work of the coalitions and have provided a well-constructed arguments' source for the resolution of this conflict. We also found that each coalition had a well-developed set of arguments for their respective positions and all shared a communal approach and attitude towards advocacy work and their overall position on the conflict. As stakeholders, they were all invested in their particular interest and perspectives and saw them as legitimate and vital in the debate over water use and its management. They all had their own sources of information and were not reluctant to share their perspectives and resources with other stakeholders. The collective actions of stakeholders and their information exchanges tended to drive the debate over the dam and to generate much of their mobilization campaigns for the opposition movement. They deliberated and acted in a contemplative manner, seeking appropriate solutions, from their point of view, to the conflict, and were not solely driven by reactionary instincts and societal divisions.

Conclusion

The conflict over the construction of the Zapotillo dam is a complex and multi-level affair**.** It has transcended local concerns and perspectives and has attracted international attention. It is also a regional conflict between the Jalisco and Guanajuato state governments and several other municipal governments

(Guadalajara and Cañadas de Obregón in Jalisco, and also Leon in Guanajuato). It is also a civic and social conflicting light of the mobilization against the project by traditional historic communities as well as civil society, regional business interests, farming and forestry concerns. The conflict underlines and examines the political and regulatory power of the state and the need for transparency and fairness to resolve this issue. Due to the financing scheme for the project and the private public-partnership that favors the business interest in Leon Guanajuato and the Altos de Jalisco region, the national water commission (Conagua) is viewed as an organization that issues or makes policies in an *ad hoc* basis, and often has preconceived notions and solutions to problems that do not take into account local and regional concerns and circumstances. There is a genuine distrust amongst stakeholders and their allies of the state institutions charged with the management of water resources. Community stakeholders tend to see these policies initiatives as legitimizing hydroelectric projects that were already developed and approved.

The Zapotillo dam conflict also shows several contradictions regarding the environmental policy. For example, the State makes the argument that initiatives and policies derive from local concerns, which developed and raised a "from the ground up" level and have been framed by an opened democratic process based on local needs. They frame their position around established regulations and norms, and assert their right as the state to act upon these "local initiatives". Another contradiction is the contention by environmental activists and experts to develop water usage policies without regarding the legitimate water usage and the development needs of the region. Our study notes that environmental and development concerns will both be ultimately included in this conflict resolution. The reality of the situation seems to be linked to the State, which must meet the challenges traditionally assigned to institutions. It is also noteworthy to point out that, since 1950 in Latin America, an emphasis on hydroelectric power supplies, access to drinking water, and the economic value of many of these projects have driven to a transnational agenda that has not often respected or even considered the needs of native communities, and/or other stakeholders affected by these efforts. These policy initiatives are being reviewed and often challenged inside of the environmental movement, water and human rights concern, and the changing societal attitude towards natural resources and their management.

In this environment, the Zapotillo dam project has become a change agent for water management public policy. However, the building of the dam has highlighted political issues and conflicts that are highly problematic. These conflicts have brought forth long standing issues surrounding the allocation of water resources and development initiatives. Mexican policies in this sector have also generated social conflicts and community preservation issues. This conflict has reconfigured the local struggle for control and power, and have added regional and international elements to other issues such as human rights, environmental

preservation and conservation concerns. Policy change hangs in the balance and, in spite of that, attitudes and concerns are changing as new socio-political perspectives and strategies are brought to the table.

In this chapter, we have analyzed the different interests of stakeholders and the thorny and problematic politics surrounding the building of the Zapotillo dam and the management of water resources. Water usage policy has been developed slowly in light of the complex, legitimated and conflicting needs of stakeholders. The goal for a resolution that is fair and transparent has been difficult to define and meet, as they attempt to reshape the "public space" or forum for the debate and resolution of the issues. We have analyzed some of the tendencies that the stakeholders, coalitions, and other power brokers have exhibited. The issue has grown in scope and has been scaled upwards from a local to a regional conflict, from a national and eventually to an international issue. In the coalition, stakeholders have been active in all these sectors and have scaled their efforts and advocacy concerns using traditional mass media, social media, community organization, and other efforts redefining the public debate on this issue. These outreach efforts have grown in scale and importance and have led to a transcendence of actions ranging from local to international campaigns. The issues have been examined from various ideological perspectives and influenced by "allies" on another outside concern. Therefore, we can conclude that the issue of water resource management brought to the public's consciousness has become a global concern. The political and social networks that have emerged from this conflict have transcended local concerns and have evolved to include other issues besides water usage (such as human rights and environmental preservation). These networks, in their capacity as negotiators and mediators in any possible solution, are key to the possibility of a fair and transparent public policy that addresses a lot of the stakeholders' concerns. These developments commit the coalitions to a social invested solution and to an intra-governmental process (within the institutions of the State nation). The formation of global political networks surrounding the Zapotillo dam conflict and the resulting water management and other concerns have given the Government an innovative path of generating policies, setting parameters for governance and collaborative instruments to involve all stakeholders and their concerns. Stakeholders will help to broker a political solution to this conflict and, in doing so, they will create new dynamic paths to a successful change.

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Part 2

Institutional Reconfigurations and Citizen Participation

5 An ecological turn in urban water policies

6 A fully-fledged expertise

7 In the shadows of participation

Protest for water access in Lima.

AN ECOLOGICAL TURN IN URBAN WATER POLICIES

The conflicts for the Water Council in Lima (Peru)

Jérémy Robert

Introduction: an attempt for the reconfiguration of water governance

Like other cities in the Americas, Lima is in the midst of a "water crisis" (Boelens, 2015; Ioris, 2016). This situation confronts individuals and collective bodies responsible for water management with two major challenges: first, scarcity in terms of water provision, and, second, urban development. Having come to occupy the center stage in political and media agendas over the course of the last few years, problems in water management concern not only the impact of environmental changes on access to water, but also shortcomings in terms of management[1]. These issues are inscribed in an international context promoting the application of environmental norms, such as the Integrated Water Resources Management (IWRM).

An analysis of the water sector in Lima is of specific interest in terms of understanding the construction and evolution of water policy, when institutional norms have to deal with the territorial logics of the technical system. Focusing on challenges in the service management, our analysis addresses the emergence of measures designed to adapt to climate change in a metropolis in the South. While the ecological cause is relatively new, contemporary changes in water policy are part of a history and a body of expertise specific to the water sector in Lima. This history has fashioned both the institutional architecture and the professional corps that underpins current governance. It provides a partial explanation for the inertia which, in spite of the introduction of important institutional innovations, continues to characterize the large operational structures in the sector supported, on the one hand, by a corps of agricultural engineers who have, historically speaking, promoted major irrigation projects and controlled policy and legislative orientations at the national level (Oré & Rap, 2009), and, on the other, by a large State company that holds the monopoly of the water service in Lima.

1 The importance of those public issues is exacerbated by conflicts between the mining industry and Andean indigenous communities, and by the growing and increasingly widespread influence of the environmentalist cause.

This research applies the theoretical and methodological aspects of the Advocacy Coalition Framework (ACF), combined with network analysis (Weible, 2005) to the subject of the emergence of environmental policy instruments in the sphere of water management. Based on a conflictual situation, its intention is to identify the various agents involved in the development and implementation of those policies (in terms of both process and systems). It studies more specifically the construction and introduction of the ChiRiLu[2] Water Resources Council in Lima, promoted within the framework of the new Water Law of 2009, which became the object of wide-ranging debate. With the objective of "participating in the planning, coordination and consultation about sustainable water management" (DS 007-2016-MINAGRI), the intention of the initiative was to unite the sector's various protagonists under the banner of the international principle of Integrated Water Resources Management (IWRM).

To which degree has the Lima Water Resources Council been successful? Does it usher in a new form of water governance in the Peruvian capital? The Water Resources Council is the object of numerus controversies. Designed as a space of coordination, this new instrument has emerged in a context marked by the absence of an autonomous administrative field covering the various aspects of water management. Several similar initiatives launched at the national level demonstrate that this space has been appropriated by dominant actors, without established power relations or logics of participation being in any way queried (Cano, 2013; Filippi et al., 2014; Oré & Geng, 2014). In Lima, the Water Resources Council crystallizes a certain number of tensions in the sphere of water policy, especially at the metropolitan level. Relations between different administrations, the management of uses and flows, costs and funding, and urban planning are all subjects of debate. To what degree do the conflicts over the introduction of the Council result in changes in approaches to the management of various water problems in Lima? The hypothesis developed here is that the process of developing and establishing the Council was accompanied by the emergence of a coalition informed by a new vision of the management model focusing on environmental themes and on a transformation of the decision-making processes towards more public participation.

In order to identify the effects of the Council on the realignment of coalitions, this research will initially present the institutional architecture of water management in Lima, as well as ongoing policy innovations in the metropolis. Then, a description of the survey's methodology will lead to a presentation of the fieldwork, focused on the establishment of the Council and on the issues revealed by that process. Finally, the data collected will be analyzed aiming at identifying the coalitions involved in implementing water policy. The Water Resources Council, which, at first sight, appears as only a partially convincing solution, reveals, in filigree, the emergence

2 From the name of the city's three rivers: the Chillón, the Rímac, and the Lurín.

of a new "alternative management" coalition and a realignment in the strategies implemented in the field of water management.

Conflicts over water regulation

The institutional architecture of water management in Lima

From a historical perspective, water management in Lima is characterized by sectorial fragmentation. This phenomenon is mirrored by two factors; first, the omnipresence of the public State company, SEDAPAL (Servicio de Agua Potable y Alcantarillado de Lima – Lima Drinking Water and Sanitation Department), which runs the water service in the urban agglomeration, and the centralization of policy decision-making capacity in the hands of the parent ministry (the MVCS Ministerio de Vivienda, Construcción y Saneamiento – Ministry of Housing, Construction and Sanitation); and second, by the fact that the legal framework governing water management is supported by other institutions, namely the National Water Authority (ANA – Autoridad Nacional del Agua) and the Ministry of Agriculture, which have historically focused on questions of irrigation. At the initiative of the water sector, and after much debate, the new water management law was promulgated in 2009 with the intention of defining a global, multi-sector framework. In effect, work on this legislation started in the early 1990s during the presidency of Alberto Fujimori. Following the introduction of the new Constitution in 1993, and within the framework of a policy based on deregulation and the promotion of investment in the private sector (notably in the management of natural resources), the 1968 Water Law adopted by the military government led by Juan Velasco Alvarado was called into question. The two main issues were the privatization of water based on the Chilean model, which the government initially promoted and later abandoned, and the role played by irrigation associations (Oré & Rap, 2009). Seventeen years of debate were required in order to achieve a compromise. Having overcome these conflicts, and with the support of international donors (particularly the World Bank), the new law introduced the most consensual IWRM principles, phasing in a new form of institutional organization based on the concepts of the watershed and of planning, with the National Water Authority taking on a central role.

The new law introduced new principles of governance. It sought to ensure that water was recognized as a public good and that its sociocultural, economic and environmental values were taken into account. Consonant with IWRM (Integrated Water Resources Management) principles, it advocates the integration of sectorial policies, a participative approach, and the implementation of a management perspective encompassing the notion of watershed. However, such an integrated management remains difficult to implement in the urban sector (supply, distribution,

processing), as it is already ruled by its own legal framework and it has exerted a strong influence on government policy since the 1990s. Opposition to such an approach is particularly strong in Lima, which, due to its sheer size (30% of the national population, over 50% of its economic activity, and the majority of the country's political powers), and to the management structures it applies, can be considered a national exception. Water management is in the hands of the drinking water and sanitation company, SEDAPAL, a private law public company of which the State is a majority shareholder.[3] As an object of modernization policies backed by the World Bank (as in other Latin American countries), SEDAPAL successfully warded off privatization attempts, dating back to the mid-1990s, primarily because of the cost ramifications of such a move (the risk of having to introduce unpopular price rises, persistent needs for public investment, etc.). In effect, SEDAPAL has served as a lever for successive policy agendas, for example the *Agua para Todos* project to extend the water network to the city's working class periphery, a project that was one of the major platforms of the second government of Alan Garcia (2007-2011) (Ioris, 2012).

SEDAPAL is part of a system of institutions governed by a parent ministry (the MVCS), a regulatory body (SUNASS, Superintendencia Nacional de Servicios de Seaneamiento – National Sanitation Services Superintendence), and a financial fund (FONAFE, Fondo Nacional de Financiamiento de la Actividad Empresarial del Estado).[4] This system defines the main political orientations of urban water management, inside which SEDAPAL interacts directly with the MEF (Ministry of Economics and Finance) and ProInversion (National Agency for the Promotion of Private Investment) in regard to financing major projects, and positions itself as the privileged interlocutor with international donors. In this context, it not only disposes of many more human and economic resources than the National Water Authority (ANA), but it also has all the infrastructure required to operate the service, including distribution networks and wells for controlling the aquifer, as well as storage facilities and infrastructure for transporting water from the Andes, which it shares with the hydroelectric company, EDEGEL (now ENEL) (Hommes & Boelens, 2016). Thanks to its management capacity, SEDAPAL occupies a central position in the water sector as a whole. As M.P., an expert water consultant, observes: "In Lima, SEDAPAL is an elephant and all the others are rabbits. […] In terms of water management, SEDAPAL is the king." [M.P., Interview, 12/2016]. The new action framework proposed by the 2009 Law was, therefore, out-of-kilter with the realities of water management in the capital, a sphere characterized by tensions between, on the one hand, the urban water service, and, on the other, the management of water resources.

3 In all other cities in the country, companies providing water management services have been dependent on local governments since the 1993 reforms (except Tumbles, where the service has been privatized).

4 National State Financial Fund for Entrepreneurship, a public law Company active in the Economy and Finances sector, responsible for funding State companies.

An institutional innovation in a context of crisis

Indeed, the institutional innovations of the 2009 Law were introduced against a backdrop of crisis in the management model. Problems in the sector, source of a multitude of conflicts, did not just affect the field of institutional organization, and attention came to be focused on the *de facto* monopoly enjoyed by the operator. Water stress and environmental issues in the city of Lima added to the pressure. These factors also had an impact on increasingly fraught disputes at the national level (Grieco & Salazar-Soler, 2013; Arce, 2015). While Andean and indigenous communities presented sometimes violent challenges to approaches to exploiting water resources, urban groups moved to protect the environment. Logics of action to ensure water for Lima, up until then based on the societal aspects covered by this essential service, were criticized, while at the same time problems became more diverse. These factors, which exacerbated the internal crisis the management model was undergoing, can be seen as an external perturbation encouraging policy change:

> "*The situation has changed dramatically. In my time (when I was head of the Water Directorate in the late 1970s), it was easy to build infrastructure to transfer water. No one talked to the people in the upper part of the watershed. Recently, with the regional governments and policies concerning environmental protection, things began to change. This was true of the Majes Siguas Stage II project where there was a major social problem in Apurímac. This is very recent. We don't know how or why the environment and the voice of indigenous people have become so important in terms of policy decisions…*"
>
> (A. D., expert, former senior civil servant, ex-CEPAL, Interview, 06/2016).

In this context, SEDAPAL is obliged, against its will, to count on the participation of other actors to solve problems in a wide range of areas, some of which are outside of its field of competence. These areas include monitoring the aquifer, ensuring that the use of the resource is paid for, surveilling and taxing pollution, and overseeing urban development:

> "*SEDAPAL has to deal with all the waste (contaminated water) produced by the others. We can't levy taxes. What we want to do is to ensure that users' rights are respected. It's not our job to monitor the springs. That's up to the National Water Authority. But to make sure that our processes work, we have to take care of that. Out of necessity and due to a lack of action on the part of the National Water Authority. The National Water Authority did no monitoring. It should have supplied us with all the inputs, but it didn't. There's a lack of authority. We provide information to the National Water Authority so that it can take action. They are the authority."*
>
> (Y. A., senior civil servant, SEDAPAL Interview, 03/2016).

Meanwhile, the National Water Authority, although it emerged from an ensemble of previously existing institutions[5] ("the National Water Authority is 120 years old," A. T., National Water Authority, 05/2016), finds it difficult to impose itself on the national scene and continues to lack legitimacy.

> "*Lima is a particular case for SEDAPAL. The National Water Authority is a sub-authority of the MINAGRI (Ministry of Agriculture and Irrigation). SEDAPAL's budget is 1,000 times bigger than the National Water Authority's, but, for reasons of legitimacy, there is a need for a public body to accredit studies*".
>
> (K. H., GIZ – Deutsche Gesellschaft für Internationale Zusammenarbiet, National Water Authority, Interview, 11/2015).

The vast majority of problems involve more or less direct cost overruns for the company. While a certain number of initiatives were taken with a view to resolving those difficulties, including the Multi-Sector Commission for the Management of the Rímac River in 2011[6], SEDAPAL focused on direct bilateral negotiations and did not hesitate to take legal action. This was true of the dispute between the Gloria Consortium and SEDAPAL over how the use of the aquifer was to be charged for. Originally filed in 2007, the case was won by Gloria in 2009. SEDAPAL was forbidden to apply tariffs or restrict access to the water table since the company's infrastructure and services were not involved[7]. A decree issued in 2010 based on the 2009 Law then stipulated an obligation to pay a fee for the use of a good considered to be a national asset. This fee had to be paid to the National Water Authority, rather than to SEDAPAL, as outlined in a decree issued in 1982 (DL Nº 148-1982). Finally, a new decree issued in 2015 (DL 1185) set up a special regime for monitoring and managing groundwater to be run by service operators including SEDAPAL under the aegis of SUNASS and in consultation with the National Water Authority.

> "*Previously, the National Water Authority arrived with a license to solve any problems that cropped up. Then it disappeared. It was SEDAPAL that established records and covered the rates based on the 1981 legal framework. Now the National Water Authority also wants to deal with prices. Who do people pay? The National Water Authority or SEDAPAL?*"
>
> (V. F., ALA Interview, 06/2016).

5 The Instituto Nacional de Recursos Naturales ("National Institute of Natural Resources") and the Instituto Nacional de Dessarrollo ("National Development Institute") merged in 2008 within the Ministry of Agriculture and Irrigation (MINAGRI). The result was the National Water Authority ("Autoridad National del Agua", ANA) (DS Nº 30 2008 AG).

6 This commission includes various ministries and a number of key actors, such as the EDEGEL and SEDAPAL, which were involved in even if they were not central to the process.

7 For example, according to the Equilibrium Report (2015), SEDAPAL spent 90 million Soles on the legal case with Gloria in 2014.

> "*SEDAPAL is an example of how to break the law. SEDAPAL was the body that managed groundwater; it stole that responsibility from the oversight body (now the National Water Authority). It's a political company. They work hand in hand with the EDEGEL*".
>
> (A. T., National Water Authority Interview, 05/2016).

Although the operator takes part in roundtables, this is not where problems are discussed, and consensus potentially arrived at. It is in this context that the Water Resources Council attempts to impose itself as a new space of governance, consultation and conflict-prevention:

> "*The idea is to promote a modern style of management. Prior to the 2008 Law, management was largely based on the agriculture and livestock sector. This started at the time of the agrarian reform within the framework of the Water Law. But it became outdated. It wasn't capable of dealing with major contemporary problems (and the diversification of water uses). The idea behind the new law is to provide advice, to plan for the efficient use of the resource, and to generate a management plan encompassing all activities and investments. Planning with all the actors*".
>
> (J. R., National Water Authority Interview, 03/2016).

To what degree do the controversies concerning the role of the Water Resources Council structure coalitions, influence policy-making, and impact the existing order? With the objective of describing the emergence of a new style of governance we shall attempt, taking into account the effects of the introduction of the Water Resources Council, to outline the convergences and tensions underlying and reconfiguring coalitions in the water sector.

The Water Resources Council as an indicator of transformation of public policy

The survey

The survey takes as its point of departure the protagonists involved in setting up the Council. The project first emerged in 2011 and eventually came to fruition five years later in July 2016. This long delay can be explained in reference not only to the implementation of a major process of participation but also, and above all, to a period in which central government failed to recognize the legitimacy of the Council. Documents intended to render the initiative official were presented in late 2014, but the decree approving the Council was only signed in July 2016, in the last weeks of Ollanta Humala's presidency. The fieldwork was conducted over the course

of 2016 when the process of establishing the Council was reactivated after over a year's silence (while waiting for the decree to be signed) by the small technical group that had remained active. The strategy on which the survey was based consisted in following the meetings organized by that group in April with the objective of gathering together the members elected in 2013, while awaiting the upcoming conformation of the Council. Surveys were also conducted with actors identified in interviews[8] and systematization documents, who had played a key role from the outset. Some individuals belonged to a particular institution and continued to do so throughout the period during which the survey was conducted (between 2010 and 2016). Others had more complex career paths, and were interviewed about their personal rather than institutional involvement at a particular moment in the process. As far as possible, the interviews were carried out with individuals directly involved in the Water Resources Council and, in the contrary case, with people holding managerial positions in the institutions retained.

At the same time that research was being conducted on the space created by the Water Resources Council, a series of interviews were carried out with important water managers in Lima. These actors operated in SEDAPAL and its parent ministry (the Ministry of Housing, Construction and Water and Sanitation), in the regulatory body (SUNASS), in the Ministry of Economics and Finance (MEF), and in ProInversion (responsible for private investment projects). Particular attention was paid to international cooperation, initially justified by the involvement of the World Bank and the Inter-American Development Bank (IDB) in the introduction of six pilot councils in 2010 and in the promulgation of the 2009 Law. The space provided by the development process of the Water Resources Council is particularly complex in the sense that it is based on an approach aimed at making numerous protagonists aware of the issues at play, while at the same time addressing a multitude of aspects of water management. This space made it possible, while following the logic of the ACF, to take into account actors with diverse profiles, be they activists, academics, experts, users or institutions.

The large number of actors involved also reflects a range of intertwining territories. Some interviewees were involved at the local level, for example in one of the valleys providing water for Lima. Others worked at the level of the urban agglomeration and its sphere of influence, for example the Metropolitan Municipality of Lima, the operator, and the hydroelectricity company. Lastly, the members of the third group interviewed were active at the national level in government agencies and ministries (which, indeed, are geographically based in Lima), and at the international level, working, for example, for donors and in technical cooperation programs. Concretely, the analysis of coalitions of actors was

8 According to the principle of "snowball sampling," which consists in interviewing the individuals mentioned in a survey.

based on four conformation meetings focusing on the Water Resources Council, and 35 interviews conducted in three different phases. The first two series of interviews were conducted between February and June 2016, focusing, on the one hand, on actors directly involved in the Council, and, on the other, on actors in the Lima water service focusing on international cooperation programs[9]. In a third phase, conducted in December 2016, several missing interviews were completed. A dozen additional interviews were left out of the statistical database due to a lack of detail or to their lack of relevance to the subject at hand.

A brief history of the Council of Lima

The objective of the Water Resources Councils, as one of the main institutional innovations introduced by the new water law, is to promote an integrated style of management at the level of specific watersheds. To the degree that they focus on multi-sectorial and inter-institutional dialog and attribute a coordinating role to regional governments, these Councils effectively represent an attempt to change the configuration of water management. Immediately after the promulgation of the 2009 Law, six pilot projects were launched within the framework of an overarching project for a period of two years, funded by the World Bank and the IDB, designed to modernize the water management system. This project implemented the principles of Integrated Water Resources Management of the law, which was initially supported by those donors. The watersheds selected were all on the coast, according to criteria that were not very explicit, but in familiar territories that had been the object of projects organized by the INADE, the body replaced by the National Water Authority. The most conflict-ridden situations were avoided, including mining disputes, the political confrontation between the central government and the regional government of Cajamarca, and the interregional conflict between Ica and Huancavelica.

None of the six pilot projects involved the capital. However, as prescribed by the law – regional governments are responsible for running the Water Resources Councils – a Council project supported by the Metropolitan Municipality of Lima emerged in 2011. The project was part of the strategy applied by the new Mayor, Susana Villarán (2011 - 2014), with a view to positioning the city on urban planning issues including the environment. As a senior civil-servant responsible for applying the strategy remarked, that sector is a priority:

> "*The FFLA [Fundación Futuro Latinoamericano] asked me to speed up the process, which had begun in January 2011. In February we signed a statement of intent*

9 These interviews were conducted with the help of Sofia Morgavi within the framework of an internship directed by the author.

for World Water Day with the Callao regional government, the National Water Authority, and Lima Provincia. I wanted to support the GORE Metropolitan Municipality of Lima's position on water management. Before that, only the middle and upper parts of the watershed were used, and I wanted to develop an integrated vision involving the use of the lower part. With this in mind, we participated in the Rímac Multi-Sector Commission. This enabled us to introduce the issue of water into urban planning and take into account variables other than land use, which falls under the responsibility of the Metropolitan Municipality of Lima. The PLAM [Metropolitan Urban Development Plan] helped us to align ourselves more closely with the National Water Authority and SEDAPAL, above all in terms of the new urban development projects to the north and south of the city. We shared information."

(A. Z., former manager at the Metropolitan Municipality of Lima Interview, 05/2016).

At the initiative of the Metropolitan Municipality of Lima, a group was set up by the three regional governments (Metropolitan Municipality of Lima, Lima Provincias, and Callao) with jurisdiction over the three watersheds supplying the city of Lima – the Chillón, the Rímac and the Lurín. This Council project receives support from the Fundación Futuro Latinoamericano (FFLA), which brings to bear expertise acquired in Equator, and is financed by the US Foundation, Tinker. The Lima Water Resources Council is run in partnership with Aquafondo, a private funding mechanism focusing on conserving water resources in Lima. Set up in 2010 on the Quito model in coordination with the FFLA, a pro-environmentalist NGO from the Lurín Valley (GEA Group) and with the support of local donors (Backus, Forest Trend, etc.), Aquafondo organized meetings with a view to developing the Lima Water Resources Council and was to be involved throughout the process.

Various experiences, particularly in the Lurín Valley where a round table has functioned for many years, served as a base from which to launch the initiative. Meanwhile, the Multi-Sector Commission for the Management of the Rímac River, which is a sort of pre-council for the city's central valley, is the first tangible result of the Metropolitan Municipality of Lima's efforts to create spaces of consultation. As well as pollution, targeted problems include water stress and overconsumption (notably due to urban growth), the degradation of ecosystems in the upper parts of the watersheds, the lack of institutional coordination, and the absence of a coherent vision of the role of the watersheds. This last point was to be of central importance in the process of constructing the Council.

Highlighting the substantial asymmetry represented not only by the exclusion of peasant communities, but also of local and regional governments, the project was designed to be a "social process, with compromises, legitimacy and training, as well as being democratic, representative and participatory" (FFLA, 2015). This

bottom-up process, coupled with the limits of funding and the fact that it lasted substantially longer than other projects, distinguished it from projects funded by the World Bank and the IDB. This long process of raising awareness about the issues of conservation, which involved various actors in the territory, particularly peasant communities and farmers' associations,[10] was overseen by Aquafondo. A relatively wide-ranging "promotion" group was set up with a view to supporting the process, as well as monitoring and legitimizing it in a context characterized by suspicion. After a series of workshops focusing on raising awareness and providing training were held (14 between 2011 and 2013), members were elected in 2013. This stage was particularly complex for the numerous (over 80) peasant communities dispersed around secluded valleys with no centralized organization. Efforts at transparency met a need to convince people of the validity of the project, and to avoid the spread of rumors and potential misunderstandings, not only between actors, but also between different water sectors. There were, however, numerous points of tension.

The setting up of the Lima Water Resources Council were realized at the Ministry of Agriculture in October 2014. The process was put on hold until the last weeks of Ollanta Humala's presidency in June 2016. This blockage had an impact on the dynamic initiated in 2011; the actors involved demobilized and a large number of elected members were replaced (only five out of 19 remained). A small technical group articulated around regional governments and including a representative of the National Water Authority and a representative of Aquafondo kept the process alive. In view of the change of government, the group relaunched joint-projects in 2016 and applied various strategies (articles in the media, official letters, inter-personal contracts) in order to obtain the supreme decree required to launch the Council. The Council was eventually officially set up just before the new government assumed power.

Issues and tensions

The Council is designed to provide a consultative space. Its primary *raison d'être* is the elaboration of a water management plan consisting on a diagnostic and a prioritization of projects to be developed, without being conditioned to the financial resources of the public authorities[11]. These activities are based on the work of its technical department, funded by the National Water Authority, whose objective is

10 As is apparent from the quotes reproduced in the systematization document, the project focused on certain actors, including irrigation associations, peasant communities, regional and local governments, the College of Biology of Peru, and the National Water Authority (ANA).

11 Bodies responsible for public investment (MEF) and the parent ministry (the Ministry of Housing, Construction and Sanitation, MINAGRI) enjoy limited influence. There are doubts about convincing regional governments to become involved in the process without incentives from central government. However, support for the Council from the national government is uncertain, as it is witnessed by the blockage of the dossier between 2014 and 2016.

to issue opinions on user rights, the treatment of waste water, the establishment of efficiency parameters, and the construction of smaller-scale hydraulic infrastructure. The Council is also responsible for monitoring and taxing water sources. On these points, and based on the information generated by its technical department, the Council is able to emit restrictive opinions [*opinions vinculantes*]. The targeted themes are user rights in regard to a new diagnostic; pollution control; climate change; and risk management.

The Council's lack of decision-making power and own financial resources is a limitation mentioned by many actors: "*A parliament without executive power*" (H. W., GIZ Interview, 04/2016); "*the advice is arbitrary and lacking in influence, without fangs. It has no impact and is unable to affect sectorial logics*" (M. P., expert Interview, 12/2016). The Council's dependency on the National Water Authority (ANA) and the Ministry of Agriculture and Irrigation (MINAGRI) is also subject to criticism: "*The 2008 Law presented the Water Resources Councils as the supreme planning bodies. In reality, in the case of water stress, for example, decisions are taken by the MINAGRI via special projects. The City has no instrument that it can use to make its voice heard.*" (I. L., SUNASS Interview, 12/2016).

In spite of its relative lack of clout, the Council initiative triggered a good deal of opposition. From the outset, there was a conflict between the group behind the initiative and representatives of commercial and industrial interests. Although they were not involved at the beginning of the process, these last came to exert an influence via the National Society of Industry (SNI) and the National Mining, Oil and Energy Company (SNMPE). They vigorously criticized the "agricultural" orientation of the initiative. Included in the promotional group, they later ensured that NGOs were excluded, basing their arguments on the legal framework and bringing technical arguments to bear against their allegedly "political" stance:

> "*We in the SNI and SNMPE began to take part later on. At first we weren't invited. We weren't on the radar. […] There was a lot of prejudice against our becoming involved. For them, water is irrigation. With boards of users, irrigation committees […]. We asked them not to lose sight of the multi-sectorial aspect […]. In addition the law outlines the Water Resources Council's objectives and who should participate in it. We only took the participation of users [and technical bodies] into consideration, and not NGOs. We discovered that the regulations stipulated the presence of NGOs, with three working groups, including the representatives of NGOs. We opposed this and had the NGOs removed. There was a problem of legality.*"
>
> (J. V., SNMPE Interview, 12/2016).

> "*We wanted there to be a balance within the Council. It includes public bodies: the National Water Authority, the regional government and the agrarian sector. Historically, farmers have been favored in that agrarian management was*

encouraged. The agricultural frontier in the upper and middle zones wants to grow. The communities and associations both say they want to expand. One of our main worries is the issue of licenses for new projects. We are concerned that our rights might be undermined."

(L. C., EDEGEL Interview, 06/2016).

The representation of "non-agricultural" sectors is problematic indeed. This category encompasses bodies involved in the management of human uses (notably the operator), as well as those involved in commercial and industrial uses (including hydroelectricity). However, according to the law, these last only dispose of a single seat per regional government, of which (thankfully) there are three in the Lima Water Resources Council. An arrangement was made between three key actors who shared the seats: SEDAPAL for the regional government, EDEGEL for the Metropolitan Municipality of Lima, and UNACEM (a cement company) for Lima Provincias, these last two bodies also acting as representatives of the SNI and the SNMPE. However, this restriction remains problematic, and has been singled out by SEDAPAL, which considers itself to be under-represented in a situation in which drinking water accounts for almost 80% of the volume of water used (agriculture 16%, mining 4%, industry 1%).

The space under construction is also an object of concern for local actors. Grouping together three watersheds under one council has generated a good deal of resistance, particularly on the part of agricultural associations.[12] They defend the specific characteristics of each valley, highlighting the difficulties and risks of centralized management. In fact, insofar as drinking water is concerned, it is the city and its operator that structures the water management territory: "when water arrives at the Atarjea [Lima's main water purification plant], there are no more watersheds." (G.L., CIP, meeting of May 27th, 2016). The criticism is, therefore, also aimed at the current domination of water management by "the actors of the city" (the operator and the government institutions) focusing on the Rímac Valley. The issue of the risk of local problems affecting the agricultural sector becoming invisible is also raised. In addition to a conflict between uses and practices, a desire to protect local specificities reflects a rejection of the hegemony of the capital.

Lastly – and, in a sense paradoxically, in that it was supported by the FFLA and Aquafondo – the process was limited to a restricted group. In fact, the model for the Council is strictly framed by the law, which defines the number and nature of its members. This rigidity can also be found in the positions taken by the Council's

12 The regulation stipulates that the jurisdiction of a Water Resources Council should be neither smaller than that of a Local Water Authority, nor larger than that of an Administrative Water Authority. In Lima, the Council corresponds to the jurisdiction of the Chillon, Rímac, and Lurín Local Water Authority (smaller than the National Water Authority).

members, particularly the National Water Authority, concerning the working groups tasked with providing technical support. In effect, external actors are only allowed to work with the Council if they meet exclusivist technical criteria: "*Groups can be theme-based. They should be exclusively technical, with professional staff. It's not an assembly; it's not a wailing wall or anything like that. Technical groups have to be more technical, more specialist than the board, and closer to the technical secretariat*" (G.L., CIP, meeting of May 27th, 2016).

The multi-sector sphere of consultation described on paper is, in reality, governed to a large degree by the National Water Authority. In fact, the day-to-day functioning of the Council and its technical department depends on resources allocated by the Authority, which reinforces a feeling that the Council has an "agricultural" bias, a bias criticized by certain actors. The Council also represents new opportunities and perspectives, notably for the National Water Authority, which is in search of legitimacy, and already oversees a series of projects in the shape of working groups and other forms of collaboration. These initiatives include the setting up of a Scientific Water Observatory in partnership with the GIZ; the integration of a working group focusing on a sub-watershed and run by the PUCP (Pontificia Universidad Católica del Perú) and the Global Water Partnership (GWP); and the Multi-Sector Commission for the Management of the Rímac, which represents a potential area of cooperation with South Korea.

The Lima Water Resources Council thus crystalizes an ensemble of technical, institutional and political issues. Designed to provide a sphere of local consultation, it has become not only a space of struggle between various actors, but also exerts a form of influence beyond its original parameters, particularly at the national level. These conflicts not only reveal tensions between territories and levels of decision-making, but also between various belief systems. A space of conflict, the Council has also become a strategic arena for several actors who often find themselves on the margins of the decision-making process or who lack legitimacy, and for other actors seeking to protect their advantages and maintain existing power relations.

The emergence of a coalition in a fragmented institutional system

The network: a fragmented and polarized structure

The analysis of the network enabled to define the organizational approaches characterizing various active groups. It should be noted that the methodological approach applied has an influence on variations in internal density *(Cf. Figure 5.1, Sociogram of the water governance network in Lima, p. 415)*. On the one hand, there is a relatively complete and dense subnetwork made up of actors directly involved in the Water Resources Council (C3). The existence of this subnetwork

can be explained by the relatively restricted nature of the subject of the survey: the Council is a specific policy instrument with well-defined and identifiable actors. Other groups in the network are less dense. Among them, two groups contain actors involved in broader themes: the urban water management service (C1), and national policies, notably those promoted in the agricultural sector (C2). Three other, more marginal groups, are involved in more specific themes: environmental policies in Lima (C4), local agriculture and the conservation of the Andes valleys (C6), and international cooperation (C5).

These clusters reflect a relatively traditional image of contemporary water governance (Miranda et al., 2017), with two main centers (C1 and C2) and an ensemble of groups connected to them to various degrees of propinquity. A relatively clear fracture separates the actors of the urban service concentrated in Cluster 1, and those involved more directly in the Water Resources Council project (Clusters 2 to 6). There are only five linkages between these two groups. This fracture confirms the phenomenon of sectorial fragmentation in the water sector.

Posing the basic question in terms of water governance in Lima means that the network is necessarily incomplete. Beyond certain exceptions that can be explained by methodological choices, the network is relatively dense, particularly when it comes to the central themes of our research. Methodologically speaking, the choice of entry via a policy instrument such as the Water Resources Unit (in addition to the urban service and international cooperation) enabled us to build up a genuinely coherent image of the main actors, simultaneously demonstrating the existence of differentiated groups within the network, and various levels of fracture reflecting the reality of current water governance. Although over twenty actors were mentioned by interviewees, they were nevertheless relatively isolated from other actors in the network. The result was a kind of halo of actors – mentioned only once – located on the network's periphery, a phenomenon that can be interpreted as the intertwining of a particular object of research with a larger, more complex system.

Beyond this general characterization of the network, some individuals stand out either due to their centrality, or to their role as intermediaries. Indeed, in terms of centrality, a number of different profiles emerge. One form of centrality sheds light on the actors responsible for promoting the Council, particularly those belonging to the National Water Authority (J.R.) and Aquafondo (Y.L.). These two individuals organize meetings, take contacts, manage joint-projects, and serve as the Council's technical and logistical intermediaries. Their institutional positions mean that they are able to interact with other central actors, thereby developing contacts with them.

Continuing to base our analysis on institutional positions, we were able to distinguish two additional central profiles. First, the technical intermediaries acting as representatives of their institutions (for example, J.C. of SEDAPAL). In spite of having relatively limited decision-making powers, these profiles are active in various spheres of consultation, including meetings and conferences, which enables them

to establish a large network of contacts focusing on technical issues. The second profile concerns actors with technico-political backgrounds (A.Z., Metropolitan Municipality of Lima; Y.A., SEDAPAL; F.M., SUNASS), who have acquired a degree of expertise and politico-institutional clout that provides them with access to numerous members of the network, as well as the capacity to mobilize other actors and exert influence.

Protagonists acting at secondary levels of centrality occupy more or less the same categories. We find actors whose centrality is explained by their expertise in the field of water management (A.D.; M.P.), or in the environmental sphere (S.D., GIZ; A.C., TNC – The Nature Conservancy). Lastly, some actors occupying positions of responsibility, or who have political positions or serve as project managers, do not appear as central actors in the network. In effect, they are mentioned as references, more on account of their position within the management structure than of their specific roles in the policy process on which we are focusing here. These logics of centrality reveal the omnipresence of a twin technical and institutional criterion that mirrors the "small world" of water management and the relative stability and homogeneity of the approaches by which it is underpinned. This interpretation is enriched by taking into account relationships with intermediarities based on the individuals who provide links between various groups in the network. In this regard, three situations can be distinguished.

The first level of intermediarity includes actors in the urban service and those involved in the development of the Water Resources Council. This relationship is essentially based on two institutions, SEDAPAL and SUNASS, which provide a link between the Ministry and the funding of organizations incentivized by the Council at the local level. This characteristic confirms the key role of the operator, as well as the regulator, SUNASS, in the current system. Relationships between these institutions and the actors involved in the Water Resources Council are, however, fairly conflictual. Although less obvious, a second link between actors in the urban service and in the Council is based on actors from the German international technical cooperation organization, the GIZ. This organization cooperates, sometimes closely, by making experts available to institutions in each group: SEDAPAL, the National Water Authority, Aquafondo, and SUNASS. Along with the GIZ, SEDAPAL and SUNASS also seem to be active on several fronts simultaneously, occupying different spaces of discussion. The third form of intermediarity is based on individuals rather than experts, whose institutions are relatively external to the ongoing decision-making process, and who act as consultants. These actors (A.D.; M.P.) have various kinds of contracts with technicians, directors and managers.

Our analysis of the network reveals the influence of the hierarchies and professional relations of each individual on their positions in the network. However, the role played by "social capital" in the career paths of certain individuals should also be taken into account (notably social capital making connections with

political personalities possible), as should interpersonal relations (facilitated, for example, by frequent meetings). From a general point of view, there is a strong dissociation between the operational approaches of the urban service and water resources subsystems. The distance between central individuals, particularly between the senior managers of each of the two bodies, reveals a lack of direct communication. An examination of the network reveals that it is the technicians who provide this link, notably in the space provided by the Council. However, this analysis is not sufficiently convincing to be applicable to an interpretation of the dynamics of policy changes taking place in this sphere.

From the network to coalitions: values and positions

The advocacy coalitions approach requires that a distinction be made between, on the one hand, predominant belief systems, and, on the other, the main protagonists who bring those beliefs to bear in the implementation of water policy (Sabatier & Jenkins-Smith, 1993). Based on our surveys, a global classification was developed taking into account five groups of variables: discourse, political preferences and beliefs, the perception of problems, the perception of governance, and privileged instruments. This classification revealed six groups that we then aggregated in four, as two of the initial groups contained only two actors each and were sufficiently similar to the others to be able to be incorporated into them *(Cf. Table 1; p 188)*.[13]

The first class encompasses actors that we shall name *"institutional integration"*, characterized by an institutional view focusing on the protection of water resources and IWRM. Made up mainly of agricultural engineers and National Water Authority civil servants active at the local and national levels, this class mirrors the main elements of Integrated Water Resource Management discourse by insisting on the importance of planning and respecting the legal and technical framework (new water law, the Council's compliance rules, etc.). Members of this class see in the Water Resources Council a solution to several problems they primarily associate with conflicts over uses (population, industrial and commercial sectors, agriculture), and with upstream/downstream relations. They also mention the challenges of climate change. While the Water Resources Council is regarded as a solution, the reference institutions they consider competent are the State and the Regions, as outlined in the law. Current institutional approaches are defended in terms of policy objectives, but opinions diverge. Some members of the class defend the interests of agriculture (the agricultural sector and its engineers), while others are more concerned with technico-environmental preoccupations (focused on the protection of water resources).

13 One group that "advocated a project based on the modernization of water resources and the protection of HR," and another that was "pro-management and international cooperation".

Table 1 - Global typology of values and positions

	Institutional integration	**Technical and managerial expertise**	**Socio-environnemental concertation**	**Technico-political and economic management**
Discourse	IWRM, management plan, legal and technical framework	Technical regulation, legal framework and private investment	Resource-pooling, participation, legal framework, and IWRM	Technical cooperation, funding and budget, private investment
Perception of problems	Problems between uses, quality, between upstream and downstream, climate change	Problems between uses, quality, between upstream and downstream, climate change	Social inequalities and poverty, climate change	Other aspects associated with management
Perception of governance	Role of the Water Resources Council vis-à-vis with the State and the Regions, institutional functioning	Role of the State as regulator, role of the private sector, opening to social actors	Role of the Water Resources Council, including peasant communities, NOGs and the State. Critique of lack of inclusion, legitimacy and fragmentation	Role of the State as regulator and role of the private sector
Policy objectives	Technico-environmental preoccupations Water and agriculture	Technical management, above all of drinking water Water for the city and economic activities Technico-environmental preoccupations	Socio-environmental preoccupations	Technical management, above all, of drinking water Water for the city and economic activities Technico-environmental preoccupations
Profiles (position and scales)	National Water Authority civil servants, agricultural engineers National and local level	Experts, consultants and managers, Engineers and public administration, National and international level	Consultants, technicians, NGOs, public administrations Local level (metropolitan)	Civil servants in the water sector and regulation, cooperation and international bodies, and managers National and international level

The second class also contains actors with *"technical and managerial expertise"* prioritizing a more operational, technico-financial vision. The profiles of the members of this class are relatively diverse, ranging from expertise and consulting to the management of natural resources. Trained as civil and sanitation engineers, as well as public administrators, they occupy positions at the national level, and often have links with the international sphere. Predominant beliefs focus on the optimization and modernization of management via technical regulation based on the legal framework and on investment in the private sector. Sharing a similar perception of problems with the first class, they also advocate the role of the State as a regulator, but distinguish themselves by their open attitude to other actors,

notably in the private sector. Generally motivated by technico-environmental preoccupations, their policy priorities include the technical management of drinking water for the urban service, and economic development.

The third class is made up of advocates of "socio-environmental concertation", participatory management largely open to and focused on environmental problems. Members of this class, which contains consultants and technicians active in NGOs, as well as in public administrations, essentially act at the local and metropolitan levels and have some connections with the international sphere. The principles of sharing knowledge and resources, consulting, and the participation of all actors are central factors in their discourse, which is also largely based on the legal framework and the principles of IWRM. The problems they identify are of a social order, including inequality and poverty, as well as climate change. For members of this class, policy objectives are, *de facto*, governed by social and environmental concerns. Criticizing the lack of inclusion and legitimacy characterizing a fragmented system, they advocate the integration of peasant communities and NGOs into the decision-making process under the aegis of the government, notably via the Water Resources Council.

The fourth and last class contains "technico-political and economic management" actors in the water sector focusing on the efficiency of the service, private sector investment, and the priorities of the operator. Members of this class include civil servants in the urban sector and national regulation bodies working alongside managers and professionals in the field of international cooperation. Their discourse is centered on private investment in major infrastructure projects and on the optimization of efficiency and profitability, as well as on the importance of technical cooperation, and financial and budgetary management. Their attention is also focused on the weaknesses of current management approaches, notably in local public authorities. The policy objectives advocated by members of this class are similar to those of the second class (pro-operational IWRM); they concern the technical management of water for the city and the economy and encompass technico-environmental challenges.

The analysis of values and positions in the network partially confirms the sectorial fragmentation and disconnection between the urban water service and IWRM. However, the fracture between the two subsystems seems to be rendered more complex by internal divisions and the emergence of advocates of a multi-sector management approach based on principles of efficiency. In the same way, the advocates of a participatory, pro-environment management approach focus on both the urban question and the issue of resources. This fracture also highlights the way in which the water sector is managed at various levels. On the one hand, there are managers and civil engineers active in the field of urban services, and, on the other, agrarian engineers and similar professionals active in the field of water resource management. However, the Council also attracts other profiles, including professionals and experts in the environmental sphere, social workers, and engineers

in the industrial and mining sectors. This has the effect of encouraging debate and introducing new fields of intervention. The world of management is, therefore, a complex one; it is a space of interactions between actors with differing beliefs, positions and practices, which transversally cut through the two subsystems we have identified. How and why do these different classes interact to form coalitions? To what extent does the existence of shared issues such as the Water Resources Council facilitate these interactions? And what channels are used?

Position and strategies vis-à-vis the Council

Our value-based classification can be completed, on the one hand, by an analysis of the positions of actors vis-à-vis the sub-issue of the Water Resources Council, and, on the other, by an analysis of the issue of recommended instruments, capacities to exert influence, and resources used *(Cf. Table 2, below)*.

Table 2 - Position vis-à-vis the Water Resources Council and impact on policy

	Institutional integration	**Technical and managerial expertise**	**Socio-environnemental concertation**	**Technico-political and economic management**
Position towards the WRC	Pro-institutional WRC	Pro-SEDAPAL and Water Resources Council	Pro-Water Resources Council participation	Little interest in/ knowledge of the WRC
Instruments	WRC	Public Private Partnership (PPP) and Water Resources Council Expertise in the private sector Financial equilibrium	Remuneration mechanisms for ecosystem services (MRSE) and Water Resources Council	Financial equilibrium and PPP
Productivity and influence	Legislation and expertise	Legislation and expertise	Aquafondo, Water Resources Council, new leadership, expertise	Legislation and ex-pertise
Resources	Political and legal resources	Political resources, technical, financial and legal power	Capacity for social mobilization, technical resources	Political resources, access to funding, to other sectors, and to international cooperation

The position of individuals vis-à-vis the Council highlights various levels of acceptance and opposition. The first three classes are globally in favor of the initiative, but there are variations in their individual approaches. The "Institutional integration" group supports the Council, first as an end in itself and as an instrument for the promotion of IWRM principles, and second as an instrument that works in favor of the interests of their institutions. In effect, the Council provides an opportunity, particularly for the National Water Authority, to acquire new resources

and initiate projects capable of reinforcing their legitimacy. For the "technical and managerial expertise" group, if the Council is perceived as a solution, SEDAPAL'S lesser degree of involvement is regarded as a problem of central importance. Meanwhile, for the "socio-environmental concertation" class, the Council is a tool for creating spaces for discussion and addressing new issues of environmental justice. On the other hand, the "technico-political and economic management" class has very little interest in the initiative, when it is even aware of it.

This analysis of privileged instruments, resources, and the capacity to influence outcomes, coupled with an examination of the various types of relationships pertaining between agents helps to reveal points of convergence between different groups. In effect, the "technical and managerial expertise" and "technico-political and economic management" group both agree on the importance of the private sector, in different forms, from funding to management. Public-Private Partnerships and research on financial equilibrium are among their preferred instruments. In terms of a capacity to exert influence, their action strategies are based on the legislative framework and technical expertise. They are joined on this point by the "Institutional integration" group, although their fields of action can sometimes diverge in function of the legal framework predominant in each sector. However, it is clear that evolutions and attempts at innovation are dependent on the existence of new laws and the modification of existing ones. It is the legal framework that supports the Council and supplies suggestions about the way in which it should be run. It is also in this sphere that operative rules and regulations reflect and define power relations between various institutions, as is demonstrated by the battle over control of the water table. Expertise has become a key tool in terms of justifying technical positions. Political resources, particularly links to the upper echelons of the administration, are exploited by advocates of IWRD. Their position is reinforced by scientific, technical and legal resources, as well as by economic arguments and sustainable management issues (water supply). However, it is the "technico-political and economic management" group that has the highest degree of access to funding and to governmental and international spaces of negotiation.

The profile of "socio-environmental concertation" advocates is clearly distinct from that of the other three classes. Insisting on environmental issues, members of this class support remuneration mechanisms for ecosystem services (MRSE, Mecanismos de Retribucion por Servicios Ecosistemicos – Ecosystem Services Remuneration Mechanism), an approach supported by SUNASS independently of the Water Resources Council. MRSE represents a potential niche for a number of organizations, including Aquafondo and other foundations and NGOs. Aquafondo is at the heart of this strategy and is itself a powerful tool of influence thanks to its capacity to fill a void in the institutional architecture. Basing its actions on the promotion of a new leadership, on technical environmental expertise, and on a capacity to access funds, it is gradually imposing itself as a central strategic actor in

the water sector, both at the technical level (directly with the GIZ and SUNASS), and at the political level (in conjunction with the Metropolitan Municipality of Lima and the National Water Authority). In the end, this group is the only one with a capacity to mobilize civil society, impacting the population at large beyond the restricted field of "traditional" professionals in the water sector.

Last, rather than pointing to a marked polarization around a particular conflict, our analysis reveals a multitude of tensions playing themselves out in various areas. While there is a line of fracture between two subsystems, and a certain degree of mutual mistrust on the part of the groups described, positions in regard to sensitive subjects are vague and do not necessarily impact the organization of the sector in regard to beliefs (either deep core beliefs and policy beliefs). However, divergences in terms of positions and visions do not seem to be cast in stone but, instead, appear to evolve in different registers. This configuration, and the complexity of the water sector in general, has two distinct effects. On the one hand (and in view of Hypothesis 6 of the ACF, according to which learning is facilitated when the level of conflict is positioned at an intermediate level), it seems to favor the emergence of a consensus based on shared interests capable of uniting actors with different, or even contradictory beliefs. On the other, it can be seen as representing a disconnection between actors in the water sector, in which a dominant coalition takes decisions independently of initiatives and evolutions occurring outside its centers of interest. In any case, it calls into question the way in which the actor network is organized.

From the typology of links to the formation of coalitions

With the objective of identifying active coalitions, we have focused on relations between individuals in order to analyze both the network and the values by which it is characterized.[14] A typology was developed based on two groups of variables: on the one hand, the nature of linkages (meetings, professional, hierarchy, etc.), the content (advice, information, expertise, etc.), the frequency and degree of institutionalization; and, on the other, the classification of values and positions. This description of linkages enables us not only to confirm the existence of subgroups identified in the analysis of the network, but also to shed light on new subgroups based on the quality and intensity of those linkages. These new groups are interpreted as coalitions. Our approach is based on the idea that "pure coalition" relations, or, in other words, individuals sharing the same values and working together on policy change, constitute the core of existing coalitions. These coalitions

14 This approach to identifying coalitions is a preliminary stage to which can be added other factors, including the resources applied, and the capacities of organizations. These factors had not yet been completed at the time this paper was written.

also include other actors, based on those cores, depending on linkages of varying types and intensity. Applying this approach, we identified two coalitions whose contours and characteristics we have been able to describe in a relatively precise way. The first coalition identified is an emergent coalition based on and around the Water Resources Council: the "Alternative management" coalition. It is opposed to a second coalition promoting "technico-political and economic management", which actually dominates the water sector in Lima: it controls the decision-making processes, defines the water policy orientations and their implementation in terms of effective policy instruments. This second coalition is structured around key actors in the management of the urban service: senior managers at SEDAPAL, ProInversion, and the Ministry of Housing, Construction and Sanitation (MVCS), who share "pure coalition" linkages. Given the orientation of this research, this coalition isn't characterized in detail and the identification of its members is still partial. Based on the survey about the Council, it is possible to analyze more finely the emergence and the characteristics of the "alternative management" coalition.

Using the results of the linkages analysis, one can identify four "cores" inside this new coalition *(Cf. Figure 5.2, Sociogram of the pro-environmentalist coalition, p. 416)*. The first "core" is based on Aquafondo and includes a number of central actors in the development of the Lima Water Resources Council, as well as an actor from the regulatory body. All of them focus on environmental subjects and share an unambiguously academic profile. The second is made up of an association between the Metropolitan Municipality of Lima, which was at the origin of the Water Resources Council initiative, and a director of SEDAPAL's technical environmental department, who was fairly reserved about the prospect of the Council without actually opposing to it. The third "core" is made up of two specialists currently working on the same GIZ project promoting the role potentially played by the private sector in adapting to climate change.[15] One of them is a head of project, while the other is a consultant and a former senior civil servant at the National Water Authority. Lastly, a forth "core" include actors of the "productive sector": representatives of industrial and mining interests (SNMPE, SNI, large companies), as well as a representative of agricultural users defending shared local interests. These actors, of which there is only a limited number, appear to be strongly united. Despite strong divergences of interests and beliefs, these actors interact regularly with the other three groups, specifically within the space of the Council. If their

15 The GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit) is developing a water observatory in Lima within the framework of an agreement with the National Water Authority (ANA). The success of the project depends on the Water Resources Council. Promoting the participation of the private sector and advocating the use of scientific information in the decision-making process, the project not only offers valuable support to the Water Resources Council, but also provides an opening onto other actors and institutions, spreading awareness of environmental issues.

participation can be described more as a control or surveillance strategy than as a change of position in regard to water policy, they, however, do agree on the policy instruments to be implemented for resolving the actual problems.

Beyond these "cores", linkages of "interested coordination", between actors who not necessarily share the same core policy beliefs, but, nevertheless, share secondary beliefs which they occasionally act on, making it possible to articulate the four subgroups. "Agency relations", based on the sharing of institutional spaces and the coordination of inter-institutional efforts, also contributes to the development of this coalition. Among other things, they facilitate linkages with other actors involved in the development of environmental policies, for example the Ecosystem Services Remuneration Mechanism (MRSE). This is true for a number of NGOs and the Ministry of the Environment (MINAM), which was previously absent from the debate. This linkages of "interested coordination" or the "agency relations" make finally possible the inclusion, although rather marginally, of civil servants from the National Water Authority and senior managers from the agriculture sector, as well as national politicians, international water management experts, and international donors.

This emergent coalition appears very heterogeneous, with various "cores" characterized by divergent profiles and interests, including internal conflicts, but with a certain coherence in the promotion of a discourse and specific instruments of water management, which represent an alternative to the traditional solutions promoted by the dominant coalition. This heterogeneity must be connected to the lack of polarization around a particular conflict (indeed, we identified a large number of tensions), which contributes probably to the difficulty of isolating stable groups with identifiable contours. The coalition seems to be more the result of a collective action than a frontal opposition: it appears to be pluri-objectives, and led in a context of strong uncertainty.

Consequently, the analyses of the database enabled us to identify the coalitions, in a relatively precise and complete manner, within a complex institutional space. In particular, it made it possible to reveal and describe the characteristics of an emerging, not yet stabilized coalition, advocating and taking action on environmental issues. This coalition is characterized by a diversity of agents which are active in and gravitate around the Water Resources Council and which largely share the same beliefs and objectives. It also goes a long way beyond the circumscribed space of the Council and crosses various subgroups within the network. It includes actors with core policy beliefs that differ in function of particular shared interests and which sometimes manifest themselves as instruments or opportunities for profit. These actors are, from time to time, capable of pulling in the same direction, with varying degrees of enthusiasm depending on their beliefs and interests and also on their positions (institutional influence, place in the network), profiles, and career paths.

This analysis also questioned the effects of this new coalition in terms of policy change, and in relation to the dominant coalition policies. In fact, various channel of linkages existed between the emergent coalition and the dominant one, specifically with the intermediation of the "productive sector" actors (between the hydroelectricity company and SEDAPAL, for example), but also via some experts. These relations can contribute to the circulation and to the diffusion of ideas and practices, but it is too early to say if the "alternative management" coalition is able to impact policy-making. It is, however, contributing to the reconfiguration of networks, perturbing the traditional organization of the water sector in Lima in two opposed subsystems - the urban services and the hydric resources - and enabling the outbreak of new actors and themes, specifically around environmental issues.

Conclusion - The Council and the reconfiguration of water policy

This analysis sheds light on how a policy instrument designed to function at the national level within a specific subsystem (Water Resources) and accommodated in the influence of international bodies, became relevant at the local level. A close analysis of the actors involved in the development of the Council and the disputes in which they were embroiled highlights strategies of appropriation, power struggles, battles waged with a view to occupying space, and reconfigurations in water governance. The dynamics underpinning the introduction of the Council and reconfigurations in public action resulting from it can be explained not only referring to a series of contextual factors, but also to the behaviors of actors and the interests at play in the field of water management. Our analysis reveals the avatars of the concrete implementation of an environmental policy and the construction of legitimacies by which it was, and continues to be, accompanied. The main change we observed was the emergence of an alternative coalition.

Considered within the framework of the ACF, the Lima Water Resources Council can be conceptualized in different ways in terms of the policy process. First, it is an instrument that emerges from the water resources subsystem, originally designed to function at the national (and international) level, but applied later by local actors. It is also an instrument that creates tensions between various actors (1) within the water resources subsystem (2) by encroaching on the territory of competence of the urban service subsystem, and (3) by the way it functions at the local level. It could be considered, in these last two cases, as an external perturbation. Lastly, it is an instrument involved in the emergence of a new coalition that has triggered a realignment of existing coalitions.

Our research enables us to propose an interpretation of coalitions in the sphere of water policies in Lima: if the "technico-political and economic management" coalition imposes itself *de facto*, an "alternative management" coalition is gradually

gaining ground. It is including a heterogeneous group of actors: the advocates of water resources policy which is seeking legitimacy; the "productive sector" actors, which appears to associate itself with current dynamics of coordination while simultaneously protecting its own interests; and the "pro-environmental" actors, which are currently consolidating its position. In this context, the Council seems to be a central issue, representative of evolutions in the sphere of water policy. By simultaneously advocating integrated management and taking into account environmental issues, this policy instrument attempts to affect a change in the system of governance. In so doing, it influences the way in which various segments of the water sector are organized. Embodying issues at the border of two sectors of public action in a context characterized by mutual mistrust, it encourages to develop a hypothesis according to which the realignment of coalitions is based on the rapprochement between these separate universes (ongoing rapprochement and object of struggle).

The Council thus represents an opportunity to reconfigure governance in the water sector, while at the same time bringing new issues and ideas to the table. If the impact of the Council *per se* on water governance is an object of debate, the process of which it is a part, and which it helps to inform, is a harbinger of change. Indeed, the influence of the Council goes further than its intended function. Beyond its institutional, technical, ultra-standardized framework – the Council as an end in itself – it creates a performative arena, an opportunity to exert influence and bring change in terms of policy, and it is capable of attracting and catalyzing a certain number of initiatives. For example, it provides a partial explanation for the gradual emergence of Aquafondo which, by fighting on several fronts simultaneously and occupying key spaces such as the Water Resources Council, has succeeded in spreading its ideas among various groups, in spite of the divergences of opinion between them. Consequently, the Council offers a space susceptible to promote integration and consensus. For the moment, levels of involvement in the Council differ, however, significantly: some actors participate actively, while others see the Council as a body that, for the moment, has little impact (and that is, in a certain fashion, unthreatening insofar as their own interests are concerned), but which should nevertheless be monitored. These strategies for occupying the decision-making space are mirrored by both convergences and tensions in the field of water governance, as well as at the technical and policy levels.

The question arises what made the emergent coalition keep functioning and what are (and will be) its capacity of incidence. Its heterogeneity and its relatively limited level of cohesion can be interpreted as an explicative factor of its low efficiency. The fact of sharing the same corpus of knowledge (that leads to a consensus on the policy instruments to be implemented to solve the actual problems), more than sharing the same beliefs (proposed in the ACF), seems to make possible the structuration of this coalition, the reconfiguration of the networks and news perspectives of policies. The future of this alternative in front of the dominant policies is far for being determined.

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Peasants communities in Morelos opposing infrastructure planned by the State Government.

A FULLY-FLEDGED EXPERTISE

Networks and collaborations in the XIII Villages' conflict (Mexico)

Jade Latargère

Introduction: the role of experts in water conflicts

Many studies on water in Mexico are aimed at producing a "committed learning" (Bourdieu, 2002), which highlights inequities in the distribution of resources, in order to contribute to a greater social justice. Works such as the one by Francisco Peña on water management in Indian communities (2004), José Luis Moreno on the Independencia Aqueduct (2014), or Jaime Peña on ''city-pool" formation (2012) evidence that researchers are getting more and more interested in understanding water rights dynamics and the conflicts they generate. However, the researchers' role is no longer solely limited to the scientific knowledge production: today, they significantly intervene in water conflicts, alongside a wide range of experts, such as activists, lawyers or consultants. These experts are actively involved in water controversies, taking a public stand against hydraulic infrastructure planned by the government, or through the implementation of science-based studies that explore the environmental and socio-cultural impacts of new water equipment. They often assist social organizations that oppose to government projects. Sometimes, they take an active part in the organization of opposition, as when they mobilized against the new General Law on Water in March 2015.

This situation raises questions on the role of experts in water conflicts. To what extent do they contribute to politicize conflicts? Are they integral protagonists in conflicts, who participate in the formulation of certain demands in water policy? Or do they just help the mobilized groups' claims to be considered by bringing both their resources and expertise to friendly causes, without sharing all the related beliefs nor fully investing themselves to lead them to success? And to what extent can they be accounted responsible for slowing social expectations down, and helping to maintain a status quo in the water policy management?

The experts' involvement seems to vary depending on each case configuration, so, in this chapter, we propose to analyze what kind of participation they have in a particular conflict situation in Mexico: the conflict of XIII Villages (2007, State of Morelos). To clarify the role played by the experts in this conflict, we take into account the Advocacy Coalition Framework assumptions (Sabatier & Jenkins,

1993). This analysis could be used in future comparisons with other water disputes in Mexico or other American countries.

In a first part, we review some of the main concepts of the Advocacy Coalition Framework (ACF), which seem especially useful to understand the role that experts play in water conflicts. In the second part, we briefly expose the conflict situation, meanwhile in the third part we analyze the relationships' network between the protagonists of the conflict. Our study does not only take into account the ACF analysis criteria – the normative and causal beliefs of the actors, the form of coordinated activities they maintain –, but also the general perceptions of the actors about the conflict, their type and level of engagement about water. Through this analysis, we will evidence that although experts share some points of view with the XIII Villages' movement, they are not an integral part of the coalition and seem rather to play a "moral activist" role (Neveu, 2011). Based on the qualitative interviews we realized at the meantime[1], we will further the discussion, wondering if, while sympathizing with the XIII Villages, the experts could have contributed to the establishment of a compromise between the two coalitions and helped maintain the status quo in water policy.

How the *Advocacy Coalition Framework* can help to understand the role of experts in water conflicts

Sabatier and Jenkins-Smith consider public policies as the result of a confrontation between several advocacy coalitions, each seeking to prevail its preferences and to turn the principles inherent to its own belief system into legal norms, through the allocation of costs and resources for a particular organization (Bergeron et al., 1998). Although the *Advocacy Coalition Framework* (ACF) is, first of all, an analysis framework of public policies, it also helps us to understand the process and dynamics of collective action. We can consider social movements as advocacy coalitions seeking to influence public policy in a particular area (a subsystem) and opposed to other coalitions that have fixed preferences and beliefs on the matter.

Advocacy coalitions, which are a key notion of this theoretical framework, are defined by Sabatier as "a set of actors from various government and private organizations, which, at the same time, (a) share a set of normative and causal beliefs, and (b) significantly participate to a coordinated activity over time" (Sabatier, 1998). Based on the Advocacy Coalition Framework, we will see experts as active members of the protest movements if they share mobilized stakeholders' beliefs and coordinate with them to achieve their goals. One advantage of this analysis framework is that it assesses the experts' engagement in an inter-relational way. Membership of an

1 This case study is also our doctoral thesis' subject.

advocacy coalition is not solely defined based on what the experts think about their involvement in the cause, it is put into perspective with the beliefs of other actors and the type of relationship they maintain with each other. A researcher may then be convinced to adhere to a movement's ideas and to be strongly committed to the defense of the cause. But placed in the perspective of the stakeholders who led the protests, it could appear that he is actually far from sharing all the advocacy coalition members' beliefs, and that he participated in a much smaller number of coordinated activities.

The ACF has already been used to analyze the role of experts in environmental issues: while Zafonte and Sabatier identify experts as full members of the pro-environmental coalition on the San Francisco Bay Water Policy (Zafonte and Sabatier, 1998), other case studies show that experts do not have firm beliefs about climate change and, instead, play the role of mediator between coalitions (Ingold and Varone, 2012). According to Karin Ingold, the experts' role varies according to the subsystem's characteristics: the more a public policy subsystem is conflictual, the more important the experts' role is as mediators or advocacy coalition's members (Ingold and Gschwend, 2014). Our research contributes to this debate, analyzing if experts can be considered as full members of advocacy coalitions that are created around the question of water resource in Mexico, or rather act as peripheral protagonists, a sort of ''moral activists" (Neveu, 2011) who sympathize with the cause without sharing all the beliefs of the advocacy coalition nor participating in all the coordinated activities to guarantee its success.

The case study: the XIII Villages' conflict

The XIII Villages' conflict arises in 2007, in the State of Morelos. Before analyzing the role played by the experts in the conflict, it seems necessary to briefly describe how water is managed in the region and the conflict history, in order to understand what were the local issues related to water policy.

Morelos, an area dotted with multiple hydraulic networks

The State of Morelos borders the Federal District and the States of Mexico, Puebla and Guerrero. Thanks to its climate, which is ideal for agriculture, it has been, during many years, an important region of sugar cane production. But its vicinity with the country's capital also converted it into a resort place for the Mexico City residents, thus inducing a significant competition between urban and agricultural water resources use.

Morelos State is known for hosting many surface water sources, called *manantiales*, which have been used since pre-Hispanic times for domestic supply

and irrigation. In the nineteenth century, most of the *manantiales* were controlled by large landowners called *hacendados*, who used them to irrigate sugar cane fields. After the Mexican Revolution, the *manantiales* were redistributed to peasants at the same time as lands and many water resources were allocated to agrarian communities[2] for the agricultural and urban use. The existence of numerous freshwater springs has spread the idea that water resources are abundant in Morelos, but, as admitted by the authorities in charge of resource management, it is an erroneous idea (Conagua, 2010). Even though there is no water-shortage strict evidence in Morelos[3], resource exploitation is complicated by some geographical and administrative factors. Firstly, the surface flow volume strongly varies during the year. Secondly, from 1966 to 2011, all new water needs had to be met through the drilling of water wells, due to a decree prohibiting the granting of new concessions on surface flows located in the Balsas River basin (Río Balsas), a situation that led to the overexploitation of groundwater and the *manantiales*' drying up. These quantitative issues are compounded by the poor quality of the resource. There are fecal coliform vestiges in many rivers, which is a result of poor sanitation in urban areas. Even if officially 91.8% of households are connected to a drinking water and sanitation network (sewer or septic tank network), a large proportion of water treatment plants do not properly function in reality, leading to river and groundwater pollution.

An important element to consider in order to understand the emergence of the XIII Villages' conflict is the fact that urban expansion is not carried out via a central water system connection, but through water networks' duplication and new water wells drilling. This is linked to the extensive urbanization model, which makes the expansion of water supply networks very costly, and the water rights system in Mexico, which assigns each user with operating rights on specific water sources. This kind of water rights management leads to the water and sanitation networks' fragmentation. There are plenty of water networks within the *morelense* territory, which supplies specific users' group.

The XIII Villages' movement: a singular conflict over access to water

Based on Paula Mussetta's typology (Mussetta, 2013), the XIII Villages' conflict can be labeled as a controversy, with water access as the main issue. Nevertheless, this situation does not apply to the frequently studied case in Latin America, where settlers from new urban areas claim to get access to water and sanitation service. The protagonists of the XIII Villages' conflict are the agrarian communities that

2 Agrarian communities that were established after the Mexican Revolution are named "Ejidos".

3 Water availability represents 2092 m3/hab. and per year. See: Comisión Estatal del Agua, *Estadísticas del Agua en el Estado de Morelos,* México, 2014.

have lived in the *morelense* territory since the Mexican Revolution. Their demand is not to get but to preserve access to water, which is threatened by the creation of new urban areas.

Since the 1990s, Morelos State has been the scene of an intensive real estate expansion, which was characterized by the construction of social households in peri-urban areas. The creation of these new residential areas[4] was made without considering the areas' hydrological characteristics, resulting in the irrigation and water supply systems' breakdown, used to supply farmer communities. Water catchments were punctured in unsuitable areas, contributing to reduce sources' flow that were granted to some groups for urban water supply or irrigation; social housings' sewage and storm water were discharged into the irrigation channels, leading to the deterioration of the quality of water used in agriculture. Furthermore, some rivers used for agricultural lands' irrigation were diverted to avoid flooding residential complexes.

In this context of environmental degradation, thirteen communities in Morelos decided to mobilize to protect their water supply system from urbanization. The conflict begins in 2006 when they learn that Emiliano Zapata's municipal government has authorized the building of more than 2000 houses within 500 meters from the source Chihuahuita[5]. This real estate project arouses great concern among the farming communities who use that water for urban and/or agricultural needs *(Cf. Box 1; p. 208)*[6]. Users fear that drilling new water wells in Chihuahuita's surroundings may dry up the source, and that housings' sewage may affect water quality. They want government authorities that have granted the project approval to step back on their decision and cancel the construction of the residential project.

The mobilization actions are directed by representatives of drinking water village committees and members of the *comisariados ejidales*[7] who, in the vast majority, are workers, peasants, and small traders. For several months, they try to negotiate with various government agencies in order to achieve the project

4 These new residential areas are designated by the generic name of "fraccionamiento" in Mexico, because they are morphologically distinct from the rest of the urban fabric. Access to the residential development is controlled and restricted.

5 The residential project was called La Ciénega de Tepetzingo and was managed by the real estate company Urbasol.

6 Additionally to the ten communities which use the Chihuahuita's water for urban supply, the villages of Tetecalita and Huatecalco, which use water of a nearby source for irrigation, and the village of Tepetzingo, where the residential complex, La Ciénega de Tepetzingo, should be built, also joined the cause. There were therefore thirteen villages mobilized in the conflict.

7 The water used for urban supply is administered in each village by drinking water committees appointed by the Community. Water for agricultural use is administered at the basin level by a users' association, but the authority of the Ejido, the "comisariado ejidal", regulates the water distribution between the land parcels to irrigate at the local level.

cancellation. As they don't receive any positive answer, in June 2007, they decide to radicalize their action and block southern Morelos roads. The blockade lasts for more than seven days, forcing the State government to consider XIII Villages' demands. The two conflicting parties intend to negotiate, but as the real estate company denies stopping the construction, the XIII Villages' representatives prefer leaving the negotiating table and submitting a complaint to the Administrative Court[8] to obtain the housing project withdrawal. At the same time, they continue to publicize their claims to a large public, organizing street protests, a discussion forum, a meeting with native people from America. The Court reaches its verdict four years later, in 2011: it admits that the authorities have committed various administrative irregularities when they authorized the residential project and orders the dismissal of licenses that were granted to the real estate company. But, at this time, this verdict results on a Pyrrhic victory for the XIII Villages' movement: they finally obtain the cancellation of *Ciénega de Tepetzingo's* building project, but, in the meantime, two other residential complexes - *La Campiña et la Provincia* - were built in the Chihuahuita's surroundings.

1. Agrarian communities and villages that use waters of the spring Chihuahuita (2006)

Agricultural use		Urban use	
Customer	Volume allowed (m3/year)	Customer	Volume allowed (m3/year)
Ejido Tetecalita	315 360	Tlaltizapán	41 390
		Pueblo Nuevo	93 714
Ejido Temimilcingo	6 685 632	Acamilpa	134 025
		Temimilcingo	112 233
Ejido San Miguel 30	2 270 592	San Miguel 30	140 291
		Santa Rosa 30	606 198
Ejido Santa Rosa 30	10 028 448	El Mirador	218 059
		Benito Juárez	6 079
Pequeña Propiedad Santa Rosa 30	441 504	Tetelpa	19 391
		Xoxocotla	670 732

Source: Reglamento para la distribución de las aguas de los manantiales y corrientes de la Barranca de Tetecalita o Agua Dulce del Estado de Morelos (1926) and patent 04MOR102936/18HOGR99, Registro Publico de Derechos de Agua (REPDA), CONAGUA.

8 *Tribunal de lo Contencioso Administrativo.*

Research questions: the involvement of experts in environmental conflicts

The XIII Villages' conflict seems an interesting controversy situation to apply the ACF because it challenges much more than vested interests. Certainly, at the beginning of the conflict, peasant communities mobilized to protect the Chihuahuita source and to obtain the cancellation of the *Ciénega de Tepetzingo's* building project. But the debate issue quickly broadened. At the beginning, the main problem was the drilling of new water wells, which might induce a springs' flow decrease, but soon communities also opposed to the agricultural land urbanization (which prevents groundwater recharge) and the inadequate sewage disposal (which causes water pollution). They not only seek the annulment of the Ciénega residential complex, but the suspension of all real estate projects around the Chihuahuita source[9]. In the *Manifiesto de Los Pueblos de Morelos*[10], traditional communities set a series of demands out, which go beyond the defense of special interests and have a range of general interest: cancel all projects that represent a danger to the safety, health and environment of Morelos' residents, and prohibit punching new water wells until it is scientifically proven that the four State's aquifers are not overexploited or polluted. In that way, we can consider that the protagonists in this conflict carry out certain preferences and beliefs in terms of water policy, as the Advocacy Coalition Framework sets down.

The XIII Villages' conflict also appears as an interesting case study because it involved a large range of experts. Researchers from different disciplines have made public statements to the press, in which they openly defend the XIII Villages' cause[11], and are in favor of a scientific mediation to assess the impact of the houses building on the source Chihuahuita[12]. Experts have also accompanied and advised XIII Villages before and during the negotiations with the State government. This makes the XIII Villages' conflict of particular relevance to think about the role they play in shaping public policy on water: are they full members of the advocacy coalition which promotes the suspension of new water wells' punching? Or do they only play a role of moral militant sharing some beliefs with the local communities, but contributing to the establishment of an agreement between the two coalitions at the same time?

9 La Jornada Morelos, June 09, 2007, *Acuerdo de pueblos y gobiernos para liberar detenidos y quitar bloqueos*; la Jornada Morelos, August 07, 2007*, exigen los pueblos dialogo con Adame*.

10 Morelos Villages' Manifest. It's a document written in the 2007 summer, in which XIII villages clarify their claims and stances.

11 La Jornada Morelos, August 07, 2007, *Debe gobierno obligar a modificar obras en función del cuidado al medio ambiente*.

12 La Jornada Morelos, August 13, 2007, *Riesgo que crezca conflicto por manantial Chihuahuita*.

Methodology and Data Analysis

We applied the same survey to 14 actors who participated in the XIII Villages' conflict[13]. The survey included open and closed questions to collect information on three topics in particular: 1. the actor's characteristics (occupation, education level, age, place of birth and residence, activist and civic engagement), 2. their beliefs on the conflict, preferences on water policy (conflict causes, institution in charge of its resolution, goals achieved at the end of the fight, preferences concerning water service price, the role of the basin committees, etc.); 3. and finally the type of relationship they maintain with other actors in the conflict (people with whom they were in contact, the frequency of the relationship, type of information they shared, etc.). This analysis method allows us to have a good overview of the network and the advocacy coalition, as it is not necessary to have answered the survey to appear in the network: from the time a person has been cited by a third protagonist, he figures on the network.

Who are the experts?

According to Delmas (2011), we can consider that experts are people who hold the competence and specific knowledge on an issue. This definition remains ambiguous: a nutrition researcher is certainly an expert in his field, but can he be considered as an expert in a controversy situation around cell phones? Not only expertise depends on the context in which the knowledge is mobilized, but it can also be the result of different trajectories. Beside the traditional experts' figure, who gained their competence from their educational and professional background, there are also the "everyday experts", whose competence is the result of the daily real experience on the field, the repeated contact they have with the issue in question (Chateauraynaud, 2008). Sociological works increasingly lead us to consider the ordinary people - farmers, peasants - as experts: because of their longstanding roots in the territory, they know better than anyone else certain problems, certain objects. To some extent, we can consider that, in our conflict, the *comisariados ejidales* and drinking water committees' representatives, who have managed the irrigation system and the water supply network for many years, are experts in water management. They have a detailed knowledge on the hydrological source behavior: by immediate experience, they know the water quality, but also its average monthly flow. They undoubtedly are competent to detect any unusual variation in the quality and quantity of the resource.

13 This questionnaire was developed within the BLUEGRASS project and adapted to the specificity of each conflict studied.

However, in this chapter, we are interested in another expertise figure: we actually want to highlight people who have specific expertise in the water policy field (due to their educational and professional background) and we seek to identify the exact role they played in the XIII Villages' conflict.

A wide range of experts involved in the conflict

In technical and complex areas such as management of water resources, it seems possible to differentiate experts and non-experts using the educational and professional criteria. Being an expert in the water field implies to possess a certain knowledge on hydrological basins, water flows, recharging groundwater conditions and resource management. One will be considered an expert if he holds a university degree or exercises a job - consultant, teacher, civil servant - which allows him to acquire these skills.

The survey's answers reveal that seven of the fourteen actors who intervened in the XIII Villages' conflict have not studied beyond high school. These seven protagonists are engaged in agricultural or commercial activities (they crop or sell goods on local markets), so it is possible to quickly label them as non-experts. Within the seven people holding a university degree, three have achieved academic studies that are directly related to the water resources management: hydrogeology, integrated water management, soil mechanics. They also carry out intellectual professions related to water resources: one owns a consulting firm specialized in water issues; another exercises the geological consulting profession; a third expert holds responsibilities in CONAGUA (Comisión Nacional del Agua), which allows us to label them as experts.

What can we say about the four other people having academic studies? Their situation deserves further analysis, because their field of study is not directly linked to the water resource: one studied law, the other economy, the third business management, and the last, filmmaking. Can they be considered as experts in the water sector? To answer this question, it seems necessary to take into account their professional and activist trajectory. We can note that two of them are working in the primary sector (agriculture, landscaping and sugar cane production) and have no special competence in water management. It therefore seems appropriate to label them as non-experts. The other two dedicate themselves to intellectual professions: university researcher and lawyer. R.G.B is a researcher in economics at the UNAM (Universidad Nacional Autónoma de México), but he was a long time militant in an association that seeks to restore the Cuernavaca city's water catchments and has participated in the Rio Balsas River basin council meetings as a civil society representative. He can therefore be considered as an expert in the water field, for his militant and professional trajectory. R.S is a lawyer in the Morelos State government. Although he didn't take part in any particular militant activity related to water resources, it seems appropriate to consider him as an expert, as the legal

knowledge constitutes a transversal competence which can be mobilized in many areas, including in the environmental and water field.

So, in the end, five of the fourteen actors to whom we apply the questionnaire can be identified as having an active expertise in the conflict *(highlighted in yellow on Figure 6.1, Experts involved in the XIII Villages' conflict, based on their educational and professional background, p. 417)*[14]. The educational and professional background identify them as protagonists who have completed university studies and are involved in intellectual professions.

The spatial rooting of expertise

Experts differ from other stakeholders involved in the conflict by their spatial rooting. All non-experts live in the place of conflict. Their involvement in the conflict responds to the fact that they were residents of the villages which are supplied by the Chihuahuita source and they were concerned about the water they use, which might be affected by *La Ciénega* de *Tepetzingo* residential complex. Conversely, experts have no territorial base with the place of the conflict. Although most of them live and work in the State of Morelos (one of the five experts lives in another State), they didn't get involved in the conflict because of an urban expansion that would threaten their water supply. This finding supports the hypothesis that the XIII villages' conflict cannot be analyzed as a mere "revolt of local communities" (Melé, 2011: 105). The group mobilized in the conflict appears as an alliance between local communities and experts in water management, who have a different spatial rooting. This makes especially important to determine what form of alliance experts have established with local protagonists *(Cf. Figure 6.2, Experts and non-experts spatial rooting, p. 418)*

Experts and betweenness centrality

The qualitative interviews we conducted with the main actors of the conflict reveal that the local communities sought the experts' intervention and help. They went to the University and asked a group of researchers to help them in their fight for the defense of Chihuahuita source. This group of researchers maintained professional relationships with several experts outside the university (lawyer, consultant geologist) and allowed the local community to get in touch with them. However, the lawyer the XIII Villages met through academic researchers did not follow-up on the legal process. Subsequently, another expert-lawyer, who doesn't have any particular ties with the university, decided to contact the XIII villages' movement and helped them to present a complaint before the Administrative Court.

14 The number of experts that participated in the villages XIII conflict is obviously wider.

The stakeholder's network that we have developed from the surveys' analysis corroborates much of this data. The collective mobilized in the conflict appears as a fragmented network: all the actors are not in contact with each other. The lawyer and expert R.S, is isolated from the experts' group and only has ties with non-experts. The rest of the experts have a strong tendency to form a band: they are all interconnected. A key concept of network analysis is the betweenness centrality, which measures to what extent an actor plays a key connecting role between people. The degree centrality reveals that almost all experts are peripheral actors of the network. Nevertheless, one of the experts holds an integrative role in the network: he is the link between peripheral experts and non-experts. This is one of the university researchers whom local communities have been in contact with, since the beginning of the conflict *(Cf. Figure 6.3, Centralities of experts and non-experts in the network, p. 419)*.

Two non-experts have a high degree centrality: C.N, a fifty-seven years old electrician, administrator of a water purification plant, and S.R, a worker-peasant in his sixties, administrator of the Xoxocotla drinking water system who studied up to secondary level. But the betweenness centrality of these two figures is different. C.N plays a key connecting role inside the group of non-experts, while S.R is not only a connecting figure inside the non-experts, but between this group and the group of experts. He appears as a gatekeeper, as most experts use him to communicate with the non-experts[15].

Nevertheless, it is important to note that the stakeholder's network we have developed from the survey analysis indicates that all the links between experts and non-experts are made from experts to non-experts when in fact, it is the non-experts who have sought the experts' intervention and help. This situation suggests that the way we address the survey have induced a kind of distortion. For this reason, we cannot exclude that additionally to his role of gatekeeper, S.R also plays the role of representative and has been designed by the non-experts to communicate with the experts. In any case, there is no doubt that the alliance with the experts' group is largely linked to the figure and the S.R personality: without him, there would be almost no contact between the two subgroups that are in a kind of structural hole (Burt, 1992).

Experts, members of the XIII Villages' advocacy coalition?

- <u>Normative beliefs</u>

The ACF presupposes that the members of an advocacy coalition share a set of normative beliefs, which they try to translate into public policy. The survey we conducted included several questions to identify these beliefs (pricing of the resource, rules for big polluters, role of basin committees, etc.), but eventually it became clear

15 In the 10 links experts share with non-experts, 5 are made through SR.

that these normative questions were inadequate to the local controversy and were insignificant from a statistical point of view[16]. Ultimately, normative beliefs of the protagonists were apprehended from issues related to the results obtained at the end of the conflict. The questionnaire included a series of closed questions, where each actor had to indicate whether the conflict helped to position new claims, build new leadership, promote new social practices, establish new institutions, reform legislation, create new instruments and/or put pressure on the authorities. It also included an opened question about the ideal solution to the conflict. Some parties mentioned the cancellation of residential complexes, others the creation of a natural protected area, while indulging their feelings about the success or failure of the fight. These questions then allowed at the same time to identify actors' expectations on water public policy and to determine if the goals were reached at the end of the conflict.

Actors' responses were grouped and cataloged into three classes, which correspond to three types of normative beliefs. First of all, a normative belief, called "pessimistic vision" *(blue in Figure 6.4, Normative Beliefs: differences between experts and non-experts, p. 420)*. Actors sharing this vision believe that the conflict has not led to any concrete results since they have failed to stop the real estate complexes construction, nor obtained the modernization of water supply network departing from the Chihuahuita source. They consider that the conflict has not induced a change in public water policy nor has helped promote new social practices. The fight has only served to pressure the authorities and position new claims. A second type of normative belief is called "community improvements" (green in Figure 6.4). Disciples of this view believe that the conflict has led to some changes at the local level: the modernization of the network, the cancellation of some residential complexes and the establishment of the Morelos Villages' Council. Although the conflict did not help to improve the public water policy, it helped to position new claims (specially in terms of pollution), build community leadership and promote new social practices. Finally, there is a normative belief called "concrete achievement" (purple in Figure 6.4). Actors who share these beliefs insist on certain tangible results obtained at the end of the fight, which led to changes at the legislative, judicial and administrative levels, even if those reforms are below the movement's expectations: cancellation of the Ciénega de Tepetzingo construction project, creation of a protected natural area surrounding the Chihuahuita source and third party assessment to evaluate the water resources' condition.

The typology of normative beliefs does not show clear differences between experts and non-experts groups. The "pessimistic vision", as the "community improvements" belief or "concrete achievement", can be found in both experts and non-experts groups. However, the statistics' crossing that we performed revealed

16 A certain number of actors in the conflict tended to answer yes to these questions, as they clearly did not have predetermined views on the subject. As we have seen, the resource's pricing and the role of basin committees were clearly not the object of the XIII Villages' Conflict.

the existence of a certain homogeneity in the non-expert group; they tend to be in contact with people sharing the same normative beliefs type: on the 35 existing links, 17 are made between people sharing the same expectations in terms of public policy, and the same perception on the fight outcome. On the other hand, the vast majority of relationships between experts and non-experts (7 of 8 links)[17] and within the experts group (8 of 9 links) are made between people who do not share the same type of normative beliefs. S.R, through which the main contact with the experts group is made, has no particular connection with experts in terms of normative beliefs. This analysis evidences the existence of an advocacy coalition composed of non-experts, but where experts do not belong.

- Causal Beliefs:

The Advocacy Coalition Framework presupposes that members of an advocacy coalition not only share a set of normative beliefs but also causal ones. The assignation of a causal responsibility is indeed a fundamental element in the definition of public problems. By defining the sequence of events that are causing a problem, causal responsibility determines the requirements that a group will have on public policy (Gusfield, 2009). As Joseph Gusfield emphasizes, causal responsibility is more a matter of belief or cognition than facts: it is a thesis on the problem origin, defining its possible solutions (Gusfield, 2009: 14).

In the case of XIII Villages' conflict, actors' causal beliefs were identified using an open question about the origin of the conflict. From the collected answers, six major types of causes to account the conflict emergence were identified: anarchic construction of houses; violation of water rights; water supply (dotación de agua) decrease[18]; water pollution; environment deterioration; and traditional communities' marginalization. All actors mentioned the anarchic urbanization as one of the causes of the conflict, which gave this criterion few statistical significance to distinguish different stakeholders' causal beliefs. Their answers were then grouped to identify four major views on the conflict origin: 1) Those who think the origin of the conflict takes its source from the non-compliance with water rights and the decrease in water supply. This perception is a form of causal belief that we have called "Non-compliance with the law." 2) Those who think the conflict origin is linked to water pollution and the decrease in water supply. We name this belief "local vision", because actors who share this vision set the cause of the conflict in the perceptual

17 In the part about betweenness centrality, we write that there are 10 links between experts and non-experts because betweenness centrality takes into account actors who didn't have directly answer the survey but are mentioned by other actors.

18 In Mexico, the volume of water that was granted by presidential decree to the communities after the Mexican Revolution for urban and/or agricultural use is called "dotación de agua". The term "dotación de agua" therefore refers to a right, but also the volume of water that is effectively serviceable by the communities.

dimension, the experience they have of their immediate environment. 3) Those who think the conflict origin is not limited to the local area but also refers to more general causes, such as environmental decline. This type of belief corresponds to an "environmental vision." 4) Those who think the conflict is not only due to pollution problems, but also linked to the marginalization of Indian communities. Called "marginalization", this view tends to attribute the conflict to injustice, inequality in water access, which derived from the populations' ethnic identity.

Causal beliefs' typology reveals significant differences between experts and non-experts *(Cf. Figure 6.5, Causal Beliefs: significant differences between experts and non-experts, p. 421).* All non-experts share a local or environmental view. The way they address the issue results from a physical transformation, a break that affected the harmonious balance between community life and its environment (Cefaï, 2012: 16). On the other hand, the experts' thoughts on the origin of the conflict are much less perceptive: the conflict causes are theorized in terms of right or ethnic injustices. These visions come from another problematization process, more theoretical and less empirical, where the conflict causes are interpreted based on the knowledge that experts have on water resources, their distribution and the legal norms that regulate water access.

Although one of the experts adhered to the conflict local view and another to the environmental vision, causal beliefs constitute a significant criterion that differentiates the type of link between experts and non-experts, at a statistical level. The vast majority of links within the non-experts group (62%) is made between individuals who share the same type of "causal beliefs", allowing to affirm that "non-experts" come together around some causal beliefs. However, the vast majority of relationships between experts and non-experts exists within people who do not share the same type of causal beliefs. This indicates that the alliance between experts and non-experts is not the result of shared causal beliefs, but of other factors we will try to identify further in this chapter.

- <u>Types of links:</u>

The Advocacy Coalition Framework presupposes that its members "participate in a significant degree, to a coordinated activity over the time" (Sabatier, 1998). Several survey questions were designed to identify the type of links that actors involved in the conflict kept between them. We first asked each person to provide the list of protagonists they were in contact with. To assess the strength of their bond, we asked them to specify their relationship's frequency. We wanted to know the frequency of their meetings during the conflict: daily, weekly or more sporadically. We also asked each of them to specify if they knew them personally, and maintained a relationship outside the conflict situation, and if they trusted each other.

In order to qualify the type of relationships that stakeholders kept within their group, we also asked each person to specify the main purpose of their meetings: technical information exchange, situation analysis, organization of protest actions,

professional collaboration, negotiation (opposition). We were able to identify six types of links from their answers *(Cf. Figure 6.6, Different forms of coordinated activities between experts and non-experts, p. 422).*

- a relationship based on the opposition (red arrow in Figure 6.6). This kind of relationship implies a certain type of contact between actors because they negotiate social demands and political solutions.
- a pure coalition relationship (black arrow in Figure 6.6). Here, actors meet to share technical information, analyze the situation and coordinate the next mobilization actions.
- a hierarchical coordination, appearing as a form of political support (blue arrow in Figure 6.6): actors meet to analyze the situation and coordinate the next steps of mobilization, but they do not share technical information.
- a mandatory coordination (brown arrow in Figure 6.6). This form of relationship involves sharing technical information and also, sometimes, the analysis of the situation. Actors understand their relationship as a collaboration that derives from their professional activity. They were induced to know each other because of the job they exercise, but over the years, some have reached to establish a trust relationship.
- an interested coordination (purple arrow in Figure 6.6), which involves both the exchange of technical information and analysis of the situation.
- an exchange information (grey arrow in Figure 6.6), exclusively focused on the exchange of technical and scientific information.

The links typology shows that non-experts share specific coordinated activities. They meet to exchange information, but also to analyze the situation and coordinate next mobilizations. The relationship they have with each other is very intense: they practically meet on a daily basis during the conflict. Some have known each other for many years and kept their friendship. The links they share with the experts are quite different: they meet less frequently, to exchange technical information, and they share no friendships or special trust. Moreover, the link between experts and non-experts stands as a unilateral relationship. When we asked non-experts to name people with whom they were in contact during the conflict, no one has mentioned having a relationship with an expert. However, the qualitative interviews show that the representatives of local communities were actually in contact with a certain number of experts. They are also the ones who went to seek experts' support, as we saw in the beginning of the chapter. This should not be interpreted as an argument that experts hold a wrong view on the relationship they have with local communities, but rather as an indication that for non-experts, there are important differences in the relationships they maintain with each other and with the experts' group they perceive as strangers[19].

19 From a methodological point of view, it shows that only a work based on quantitative survey and qualitative ethnographic work can really reveal the relationships that actors within a network established.

Our analysis confirms, besides, that the experts and non-experts' groups maintain very different forms of coordinated activities. While non-experts hold a pure coalition relationship – they meet to exchange technical information, analyze the situation and coordinate the next steps of mobilization –, collaboration within experts is mainly based on technical information exchange and professional collaboration. They keep relative strong ties with their pears, stronger than those binding them to non-experts: some experts have known each other for many years and have had the opportunity to professionally collaborate before the XIII Villages' conflict, within the Río Balsas basin committee, or in some consultancy projects.

Experts and non-experts' relationship bases

Based on the ACF framework, our analysis reveals that experts are not part of the advocacy coalition of the XIII Villages: they do not share the same type of normative and causal beliefs as the non-expert group does, and they do not maintain a similar coordinated activity. If experts and non-experts do not match for certain normative and causal beliefs, it is then worth asking what the foundations of their relationship are. Other analysis criteria can help us to answer this question.

- Shared perceptions:

The survey that was directed to the XIII Villages' conflict protagonists included a series of closed questions that brought clarification on the actors' perceptions on the conflict. We asked them whether the conflict was related to socioeconomic problems (inequality, lack of technical resources), environmental degradation (pollution), financial aspects (water pricing), opposition between sectors (industry versus agriculture) or between regions (upstream/downstream), or governance deficiencies. The responses were grouped into three major classes, which correspond to three types of perceptions *(Cf. Figure 6.7, A certain number of shared perceptions between experts and non-experts, p. 423)*:

P1) a "local vision" of the conflict (red in Figure 6.7). Actors who share this view believe that the conflict is not related to a problem of articulation between territories or economic sectors. However, they consider that the conflict has to do with inequalities, environmental degradation, water pricing, and governance deficiencies. We call this vision ''local" as actors tend to focus on the immediate causes of the conflict (water pricing, pollution, lack of technical resources to maintain the network) and omit its macro causes (drying sources due to upstream areas' massive urbanization).

P2) a "glocal vision" of the conflict (orange in Figure 6.7). Actors sharing this view believe that the conflict is not bound to a governance problem. They focus at once on local manifestations of water problems (environmental deterioration, water pricing and lack of technical resources to maintain the

network) and on its macro causes (the wrong articulation between territories and economic sectors).

P3) a "global vision" of the conflict (green in Figure 6.7). Actors who share this perception apprehend the conflict as the result of governance deficiencies, wrong coordination between territories and environmental degradation. They consider the water pricing issue as not playing a decisive role in the conflict, thereby prioritizing macro rather than local causes.

The statistical analysis shows that the type of perception is not an element that links the non-expert group with itself. The majority of non-experts' links (77%) are made between people who share different views. But this typology is interesting because it shows that experts share some common perceptions with non-experts. In the 8 links experts share with non-experts, 6 are made between actors who have the same perception on the conflict. Alliance between experts and non-experts can then be explained by the fact that they share a number of common views, a certain vision of the conflict. We can note, besides, that the conflict's ''global vision" is not only shared by the local actor who is more engaged in a relationship with experts, S.R, but by other local protagonists.

- Experts and multi-level resources

Experts own resources that local communities do not have: access to other territorial levels. Local actors are committed to water, but at the local and state levels. As representatives of drinking water village committees, non-experts are in charge of water supply inside their community. Although they are involved in militant and associative activities on water, their scope is limited to the State of Morelos: most of their actions are aimed at obtaining *morelenses* rivers' sanitation and protection.

Conversely, experts' action is not restricted to the local area *(Cf. Figure 6.8, Types and levels of commitment of experts and non-experts around water, p. 424)*. The majority of experts work on water issues at national and international levels, whether because of their professional or associative activities. Some participate in international conferences; others perform consulting work in different states of the Mexican Republic and have contact with associations and organizations that are involved in water management in different parts of the country.

This situation might suggest that local actors establish partnerships with experts to acquire resources they do not own and reduce uncertainties in their environment, according to the Resource Dependency Theory (RDT). It seems possible to argue that members of local communities, including R.S, sought to connect with experts to enjoy the skills and resources they had on water issues, especially the access to other territorial levels. They thought that experts could help them position their cause in the public arena. It does not exclude that the alliance between experts and local communities was also made possible by the fact that they share certain forms of perception. As Christopher Weible showed in the work he devotes to marine natural

areas' policy in California, relationships within actors in a network can be explained both by dependency to resources (stakeholders search to interact with actors they perceive as influential) and belief similarities (Weible, 2005).

We can presume that the alliance with the experts has largely contributed to get the conflict out of the local sphere, and project it on the national and international scene. The XIII Villages' conflict had a huge resonance in the media. Regional and even national newspapers covered the conflict for several months. Although the leaders of the XIII Villages' movement were in the vast majority peasants, workers, and small traders, whose activities were limited to the State of Morelos, they managed to forge alliances with a large range of national and international organizations, as the Nissan carmaker workers' union, Amnesty International officials, Bolivian organizations in defense of water, and the Italian political organization "Ya Basta".

Conclusion: the water expert, advocate or broker?

The analysis we conduct confirms that non-experts form an advocacy coalition because they share normative and causal beliefs and participate in a coordinated activity. The group of experts does not adhere to these normative and causal beliefs, and it does not participate in this form of coordinated activity. We can then say, according to ACF presuppositions, that they are not part of the XIII Villages' advocacy coalition. Rather than directly participating in the formulation of demands concerning water policy, we can conclude that experts play a role of "moral activist" (Neveu, 2011): they help the mobilized groups' claims to be considered, making their resources and know-how available to a cause for which they sympathize, without sharing all the related beliefs. As one of the experts told us, "*we have never tried to lead the movement, it was their cause; our work consisted in reminding them they had a lot of resources they can use*."

Our analysis suggests that the alliance with experts has largely been motivated by the local communities' interest in acquiring resources that were not available in their environment, according to the Resource Dependency Theory (RDT). The degree centrality indicates that this alliance has not been worn by all players in the network, but by a particular actor, S.R, and facilitated by an expert who had professional links with several researchers and consultants. We can assume that S.R sought to establish alliances with experts to draw on the resources they had, not only their knowledge and skills, but also their access to national and international level, which appears as an essential asset to influence water public policy. As experts shared a number of common perceptions with the XIII Villages' advocacy coalition, they agreed to put their legal, scientific and political skills to support the cause, without completely investing to ensure its success.

Nevertheless, it is important to note that the role of cause's sympathizer is not incompatible with the one of policy broker. As Paul Sabatier notes, the distinction between the advocate and the broker rests on a continuum (Sabatier, 1993, cited by Bratt, 2013): some advocates can help to maintain the stability of the policy system, while some brokers may carry out preferences in terms of public policy and sympathize with an advocacy coalition. In the case of the XIII Villages' conflict, one may wonder if while sympathizing with the cause, experts have not actually played the role of broker. The interviews we made reveal that experts provided local communities advice on protest actions they should take and recommended them to use their native symbology to give more strength to their movement. But they never gave them the scientific evidence they required to prove in Court that the flow of Chihuahuita source had decreased and was affected by urbanization. However, subsequently, they agreed to conduct an independent expertise for the CONAGUA and real estate companies, to determine the availability of water resources and assess whether construction of new residential areas might affect the Chihuahuita source. The expertise concluded that there was an area upstream from the source where it was necessary to limit the drilling of water wells, but that residential areas planned outside this perimeter could be built. These results were presented at the XIII Villages' coalition and accepted by the movement, as "independent experts" conducted the study. It allowed the government to continue the construction of new residential areas in Chihuahuita's surrounding. This type of intervention appears as one of a policy broker.

The experts' behavior matches with the assumptions made by Karin Ingold and Frédéric Varone on policy brokers (2012). Policy brokers are not disinterested protagonists. They strategically act when seeking a compromise between coalitions and pursue their material interests. In the case of the XIII Villages' conflict, statistical data and network analysis evidence that the experts share a form of coordinated activities based on professional collaboration. Although they sympathize with the cause of the XIII Villages, they were not willing to support the movement against scientific rationality or against their professional interests. They agreed to realize the expertise that CONAGUA and real estate companies had solicited, but not the scientific studies local communities asked, and did not offer salary compensation. The lawyer who presented the XIII Villages' complaint to court won the trial, but he delegated midway part of the file to colleagues to reach a position in the state government. As one of the experts who intervened in the XIII Villages' conflict explained us, "*when asked an opinion, I have to be as impartial as possible. If I commit to favor one or the other of the parties, I lose my prestige as a scientist. There are cases where I was required to work for communities, but these are different situations*." It thus seems that in this conflict, experts' behavior was finally guided by scientific and professional interest, more than by a shared belief in the cause.

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IN THE SHADOWS OF PARTICIPATION

Coalitions of water access in Ilhabela (São Paulo, Brazil)

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Introduction: availability and access to water

It is generally admitted that Brazil lives a comfortable situation in terms of hydric availability (Rego-Filho, 2014). However, it is worth noting that water distribution in the country is heterogeneous, given that the Southeast region presents one of the worse relative availability per inhabitant (ANA, 2014). Besides the heterogeneous water distribution, other factors, such as hydric resources management and control, standout when it comes to water access. In other words, water access can be associated with hydric availability, however availability is not determining. The access is not only defined by natural biophysical factors but also – and mainly – by political and economic factors.

Accordingly, this study addresses the dispute for water access in a county located on the north coast of São Paulo, which is facing certain availability restriction, but mainly political-economic interests that influence the issue. Thus, this study consists in addressing and discussing how the coalitions and networks set between local residents and the main economic activities (especially tourism) deal with conflicts resulting from the lack of water supply. In order to reach our goal, this case study about a dispute for water access involves the water transposition between two micro-basins belonging to the São Sebastião/Frade stream sub-basin, located in South Ilhabela County. Water catchment in this location is done right from the hydric bodies (waterfalls) since the location is not assisted by the water supply company. The water source causing this conflict is a waterfall that should provide water to a local community, to a second home ownership condominium and to a cultural venture. This socio-environmental conflict about natural resources also derives from the need of catching water through an alternative way in Ilhabela County. The conflict was selected as case study because it depicts the water access issue in the region. Based on interviews performed with members of the Watershed Basin Committee (*Comitê de Bacia Hidrográfica* – CBH), it was possible to find out that alternative water catchments take place regardless of the standard of the real states or of their owners' income. There are situations where populations

living in precarious settlements capture water for direct consumption, as well as condominiums and high-standard houses for other uses.

The present study argues whether the decisions made for solving the conflict come from participative and decentralized spaces institutionalized by the legislation in office, either for hydric resource management or for sanitation issues. The assumption is that defense coalitions act in the existing institutions, which involve governmental and non-government actors in participative and decentralized spaces focused on water management (watershed committees). However, the decisions made to stop the conflict are not developed in these spaces, but in powerful governmental institutions. It shows a gap in the aim of the legislation, and in its practice, in the public definition of water policy.

The socio-political configuration of the network formed by actors committed to forums and arenas about the topic that will be herein analyzed is based on the Advocacy Coalition Framework (ACF). Primary data were collected during fourteen interviews (conducted between July 2015 and October 2016), but also from news reports, minutes, newspapers and public interview pages, among other means, which were adopted for actors who were difficult to be contacted, such as the president of the sanitation company and the Secretary of São Paulo Hydric Resources, among others. Other ten actors were mentioned during the interviews; however, they were not interviewed since they have no straight influence on the studied topic.

Contribution from the ACF approach to the study about the conflict in Ilhabela

In the ACF approach, the articulation and organization of the protagonists of the water conflict is highlighted by the analysis of coalition structures and their re-compositions. It focuses on grouping processes due to the rationality of the involved actors, who are individuals interested in similar and shared values and ideas (Sabatier, 1988; Weible, 2006). Coalitions are groups of actors formed according to different positions; these actors can be elected representatives, public servers, leaders of specific groups of interest, researchers and scientists, among others. They share certain belief systems, values, ideas, goals and perceptions about the matter, as well as show a degree of coordinated actions throughout time. According to Sabatier and Jenkins-Smith (1993), the coalition belief system is composed of one *deep core* and one *police core* – which is composed of the most relevant positions concerning public policies related to programmatic and strategic options to reach the core values. Finally, there are the instrumental aspects (*secondary aspects*) referring to all the secondary preferences of lower importance, which are not necessary to implement the *police core*.

With regard to the present study, the coalitions defined for the Ilhabela case are close to the understanding about "*policy community*" and to the concept of

"*sub-government*" (Pross, 1986). The notion of policy community was adopted by Pross (1986) to describe a group of public and private actors interested in the public policy topic; Coleman & Skogstad (1990 apud Skogstad, 2008), in their turn, understand the sub-governments as political networks. Despite using the coalition defense, the proposition of analyzing the coalitions also lies on the concept of "issue network", when it points out that, in many cases, the relations are featured as "informal and fluid" and allow greater entrance and exit flow of actors. According to Sabatier (1988; 1998), Sabatier & Jenkins-Smith (1993), Sabatier & Weible (2007) and Weible (2006), these coalitions dispute for the public policy process inserted in a sub-system, in which there are interactions among different actors, institutions and ideas (Capella & Brasil, 2015).

The coalition approach seemed relevant for understanding the power relations and the organization of social actors acting in the water supply topic in Ilhabela County, if one takes into account that coalitions can involve multi-level actors, i.e., actors who act in the local, state and federal spheres, as well as in some international spheres. Regarding the herein addressed case, it was possible to identify and analyze the articulation between municipal actors, or between actors who act in order to meet the municipal development interests, mainly focused on the coastal tourism sector, or else between actors who aim at reducing water access inequity. Finally, it enabled assessing the articulation between actors who have state and regional political-economic interests, a fact that allows favoring the economic interests in the São Paulo Metropolitan Region (*Região Metropolitana de São Paulo* - RMSP) *(Cf. Annex 2 - Water Policy and Technical Systems in Brazil; p. 40-49)*.

Study sites and the socio-economic aspects of the case study

Ilhabela County is located by Ubatuba, Caraguatatuba and São Sebastião counties, which, together, compose the São Paulo State North Coast. Ilhabela is limited by São Sebastião canal on the Northwest and by the Atlantic Ocean on the North, East, South and West. Ilhabela is located in São José dos Campos Administrative Region, approximately 210 Km from the state capital. Nowadays, it is part of the Paraíba Valley and North Coast Metropolitan Region (*Região Metropolitana do Vale do Paraíba e Litoral Norte* - RMVPLN[1]), in the North Coast Sub-region (POLIS, 2013).

When it comes to sanitation, and, more precisely, to water supply, the state of São Paulo presents the best assistance indexes in comparison to other regions in

1 It was recently implemented through the Complementary State Law nº 1166 from January 09th, 2012.

the country (SNIS, 2017). It is possible to observe that the mean hydric availability index in São Paulo North Coast is relatively high; however, a growing demand for water resources is also observed (CBHLN, 2014). Overall, it is a high rainfall rate region (above 1500 mm/year), which has most of its vegetation preserved; a fact that assures a more regular water flow. Data from 2017 (SEADE Foundation) show that this region presents low demographic density (159.98 inhabitants/km²), when it is compared to São Paulo State as a whole (175.95 inhabitants/km²).

Ilhabela County shows a demographic density rate of 92.05 inhabitants/km² (SEADE). This county shows growing demand for water resources, since, according to Foundation State System of Data Analysis (SEADE Foundation), the local population presents a geometric population growth rate of 1.86%/year (data from 2010 to 2017), which is above the regional (1.54%/year) and state (0.83%/year) average. Such growth is mainly ramped up by the offer of job positions in the region, mainly linked to tourism and to the construction sector, as well as by the creation of the RMVPLN (Marandola et al., 2013). The tourism activity stands out as the main economic activity in the region, which is followed by commercial activities and services. There is an expressive number of summer houses, hotels and inns – besides the trend of expansion –, which resulted from the constructions of new buildings to meet the touristic demand (IPT, 2001). The entire region suffers from lack of water supply services and from the absence of sewage collection and treatment (CBHLN, 2013). Data from 2010 point out that the water supply service in Ilhabela County covers 81% of the demand (SEADE), whereas the sewage collection services cover 28% of it; only 4% of it is actually treated (CETESB, 2017). The water supply service is mainly deficient when it comes to meet the demands in areas presenting higher population concentration mostly located in the county's central areas (POLIS, 2013).

The current research focused on the case study depicting the water transposition conflict involving two micro-basins inserted in the São Sebastião/Frade stream sub-basin, both located in South Ilhabela County. The estimated hydric availability for each micro basin points out that the island presents high mean availability in relation to the total[2]. The South region of Ilhabela presents approximately 25% to 30% of the total of its water available officially compromised by the right of use, which is granted by the São Paulo State Water and Energy Department (CBHLN, 2014). Alternative water catchment (straight from the water body) features a usual situation in the North Coast of São Paulo, which often does not have the proper catchment use and treatment for human consumption (SIGRH). Regarding land use, there is an interleaving of different economic classes in different regions of Ilhabela County. According to local diagnosis, which was conducted by the Polis

2 The instrument was set by National Hydric Resources Policy, which was implemented by Federal Law n. 9.433/97. This law aims at assuring the quality and the amount of control over the hydric resources and the effective respect to the right to access to water.

Institute (POLIS, 2012), the population fixed throughout the 1990s presents mean income lower than the fluctuating population – which have high-level second ownership houses in the county.

The study site reflects the aforementioned situations, since it holds a closed condominium of high-standard second ownership houses[3] and a precarious settlement facing a landownership regulation process. If the public supply systems assist areas presenting higher population concentrations mainly located in the central areas of the county (POLIS, 2013), the water supply service has a hard time providing the isolated and non-densified areas, as it happens in the herein assessed case. Accordingly, the study site – São Paulo North Coast – is inserted in the North Coast Hydric Resources Management Unit (*Gerenciamento de Recursos Hídricos do Litoral Norte* - UGHRI-03), which holds the North Coast Watershed Committee (*Comitê de Bacias Hidrográficas do Litoral Norte* - CBHLN), which was launched through State Law (São Paulo) nº 7.663, from December 30th, 1991. It is a collegiate body of consulting and deliberating nature of the Integrated Hydric Resources Management System (*Sistema Integrado de Gerenciamento dos Recursos Hídricos* - SIGRH). Members representing state and municipal organs, as well as civil society, participate in CBHLN (CBHLN, 2016).

In order to understand the water supply issue in counties in the São Paulo State North Coast, exploratory interviews were conducted with local actors; they were then completed by analyses of the minutes from the Technical Sanitation Chamber of the Watershed Committee (*Câmara Técnica de Saneamento do Comitê da Bacia Hidrográfica* – CTSan/CBHLN). Based on such initiatives, it was possible to notice the existence of a socio-environmental conflict caused by the need of developing alternative water catchment systems in Ilhabela County, as well as sanitation policies defined by a state company. Based on such context, the case study about water transposition in the Frade/São Sebastião stream was chosen for the research. The water in the location is not enough to meet the needs of the local community, of the condominium of summer houses and of one cultural venture – the last two items concern the tourism[4] recorded in the region throughout the year.

This conflict results from SABESP's actions in the city, which only provides partial water supply (81%) (CETESB, 2017). There are many water uses in one of the micro-basins involved in the conflict, which are mainly related to the touristic sector (the most important economic sector in the region) and reach its hydric

3 According to the Polis Institute (2012), condominiums of middle and high standard levels present construction areas bigger than 200m²; they always have 2 or more parking slots in the garage and 3 or more bedrooms.

4 This information was gathered through interviews conducted with local actors from neighborhood associations and from the North Coast Watershed Committee, which are not identified in the current study.

support capacity[5]. The right to use the water for water catchment in the neighboring micro-basin was issued due to the unavailability to meet all the activities that have been implemented in this micro-basin – mainly in summer house condominiums (with pools and other uses of water for leisure purposes) and in a cultural venture (which will mainly host tourists in high season periods). The local community living in this second micro-basin is composed of a migrant population that moved to Ilhabela looking for jobs and that nowadays are living in irregular situation or facing landownership regulation processes. According to the interviewees, the community living in the watershed does not have the license to use the water, since they are in an irregular situation.

Institutional context of the conflict

Local/municipal, state/regional and national (federal level) organizations have influence on the conflict; at local and municipal level one finds the residents associations and two NGOs. One of these NGOs has straight influence on the conflict and on the Residents Association in the neighborhood, and both participate in the North Coast Watershed Committee (*Comitê de Bacias Hidrográficas do Litoral Norte* - CBHLN). The Municipal Environment Secretary (*Secretaria Municipal de Meio Ambiente* - SMA-Ib), the SMA from other counties, the Ilhabela City Hall and Ilhabela State Park (*Parque Estadual da Ilhabela* - PEIb) also participate in it, since all the natural water production comes from areas inside the park; finally, SABESP, which acts in region, is also a member of CBHLN.

Many organs and institutions at state level have direct and indirect influence on the water supply topic, namely: the Water and Power Department (*Departamento de* Águas *e Energia* - DAEE), which participates in CBHLN and acts in the North Coast and Paraíba Valley region; the Brazilian Federal Government Agency for Law Enforcement (MP State), with emphasis to prosecutors who act in the Special Acting Group on the Defense of the Environment (Grupo de Atuação Especial de Defesa do Meio Ambiente - GAEMA); the São Paulo State Environment Company (*Companhia Ambiental do Estado de São Paulo* - CETESB), which also participates in CBHLN; and SABESP, which is the state company (despite its municipal and regional managers). The Brazilian State Government Agency for Law Enforcement prosecutors act at federal level, they also directly or indirectly influence the matter whenever there is some sort of deviation with regard to legislation. Figure 7.1 represents CBHLN as an institution focused on integrating different institutional

5 Hydric support capacity is the hydric balance in the micro-basin; it takes into account the quality and amount of the hydric availability to meet the anthropic uses and the ecosystem maintenance itself.

levels to promote a forum to debate and deliberate about subjects associated with watersheds in the São Paulo State North Coast.

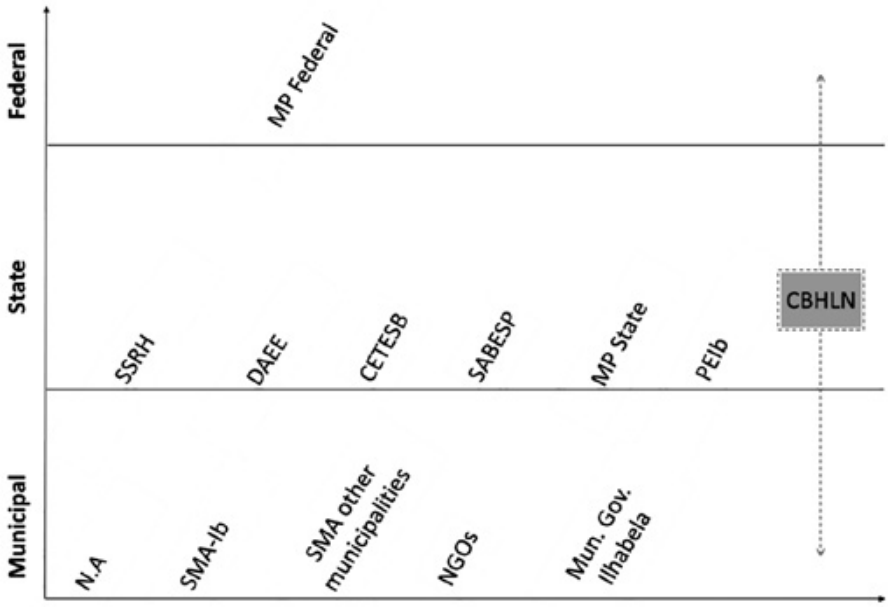

Figure 7.1. Action level of organs and institutions involved in the water supply service topic and that influence the local conflict

Thus, the specific matter of water supply and sewage sanitation is discussed in the CBH scope, whose representatives from organs responsible for making the decisions are part of. There are also other specific participative spaces, such as the Public Hearing that took place in 2013 in order to consult about the Municipal Ilhabela Sanitation Plan (*Plano Municipal de Saneamento de Ilhabela*) (Ilhabela Sustentável, 2013). So far, the water supply, sewage collection and treatment services composing the basic sanitation would have the responsibility in the county (Alves, 2008). Therefore, according to the Decree n. 7.217 from June 21st, 2010 (Brazil, 2010), the county is responsible for elaborating the Municipal Basic Sanitation Plan (*Plano Municipal de Saneamento Básico* - PMSB), as an integrating Municipal Sanitation Policy (Funasa, 2012). Yet, according to this decree, politics should coordinate the public sanitation services by taking into consideration the function of providing, regulating and supervising the services, as well as of having social control and an information system.

In 2012, the Complementary Law nº 1.166 included the North Coast in the Paraíba Valley Metropolitan Region and created the RMVPLN. The ownership

of sanitation services within the metropolitan region formation context is shared between federal entities (Alves, 2008); therefore, the legislation, although inaccurate, does not state that services will be of exclusive responsibility of the county or the state. After the RMVP-LN was created, the "Development Council" was launched; it is a normative and deliberative organ (São Paulo, 2012). Decisions about subjects such as sanitation are made in this council, which must be composed of municipal and state representatives (Alves, 2008).

Development of the conflict

The conflict became more explicit in 2012 because of the rainfall behavior, which was quite below the average after the second semester of this same year (ANA, 2015). The amount of water available, as well as the distribution of resources, affects the access to water in the North Coast regions, where the supply systems strongly depend on rainfall. The available flow is reduced throughout the low rainfall period. The summer house condominium located in the conflict location catches the same flow licensed throughout the year, a fact that causes the lack of water to supply the local community in the micro-basin where the water is transposed.

Local actors from the residents' association and from the local NGO (NGO1) looked for the CBHLN members during the period of lower water availability and called their attention to the problem. Many local actors relevant for the debate about socio-environmental issues became aware of the conflict because the Committee[6] is a space for interaction between different representatives from governmental institutions and civil society. An articulation between local actors started to happen after this process was set; it involved governmental environmental-quality control organizations and the water supply and sewage sanitation company (SABESP), Ilhabela City Hall (which was represented by the Environmental Secretary), and other organs with active participation in CBHLN. The articulation aimed at assessing alternative solutions for the conflict.

The local actors (members of the local neighborhood associations and of the NGO acting in the county) also discussed the possibility of reducing water catchment with representatives from the condominium, although they did not succeed. Thus, they got in touch with CBHLN and gathered with many influent actors in order to find a solution for the matter. CBHLN actors, in their

6 The committee would be a forum to discuss and deliberate about the guidelines set for the Hydric Resources Management of the North Coast Hydric Resources Management Unit. As the sanitation topic is related to the use of hydric resources, this issue is treated and has a specific technical bureau (Sanitation Technical Bureau –*Câmara Técnica de Saneamento* / CTSan).

turn, included the subject in the agenda to be discussed in CBH and Sanitation Technical Bureau meetings.

The articulation between governmental and non-governmental actors walked towards an alternative proposition for the water supply system, which would be implemented through a pilot project and financed by the State Hydric Resources Fund (*Fundo Estadual de Recursos Hídricos* - FEHIDRO[7]). The proposition was discussed and deliberated by CBHLN along with DAEE, SABESP (local), county managers (city hall, environment secretary, construction secretary, health secretary and housing secretary), Environment Prosecution (*Promotoria de Meio Ambiente* / GAEMA – MP) and CETESB. It would be done in order to provide the region with an alternative system of water treatment and distribution and sewage sanitation, which would be made possible by FEHIDRO resources and SABESP participation (CT-SAN, 2012a; 2012b; 2013a; 2013b; 2013c; 2013d; 2014).

The proposition got larger regional visibility and was presented as an example of pilot project to be implemented in other locations (ABES, 2013; REBOB, 2014; Engecorps & Maubertec, 2014). However, the sanitation company (SABESP) argued that the area of conflict was in its action plan and that, therefore, it would be assisted by SABESP. Accordingly, the conduction of a local pilot project funded by FEHIDRO would not apply. The reduced rainfall rates recorded during this period in the Southeast region affected the São Paulo State Metropolitan Region, and it was in the mainstream media in 2014 as the "São Paulo Hydric Crisis" (Jacob, 2014; IDS, 2014; Jacobi et al, 2015; Tadeu, 2016). Thus, the investments supposed to be done in water supply and sewage sanitation services were concentrated in water catchment projects in São Paulo[8] region.

Some of the local interviewees reported that the hydric crisis evidenced that the focus of the sanitation service management, with emphasis on the water supply, was and is on the São Paulo Metropolitan Region (RMSP). Besides all these facts, it is worth remembering that, back in 2012, the RMVPLN was created. So far, according to information collected from local actors, it is possible noticing that decision-making about investments in the implementation and broadening of supply networks, as well as in sewage collection for further treatment, depends on negotiations between the mayor and the concessionaire company's management. Alves (2008) pointed out that, even with a Metropolitan Region, because there is a deliberative council composed of municipal and state members, the municipal autonomy to manage sanitation supply would be preserved but also shared with the state government.

7 The State Hydric Resources Fund *(Fundo Estadual de Recursos Hídricos* - FEHIDRO) was created through Law 7.663/91 in order to provide financial support to the State Hydric Resources Policy and to subsequent actions (Giacomini, 2016).

8 Information from interviews and News reports from 2015 (Lobel, 2015; Leite & Akel, 2015a; 2015b; Arcoverde, 2016).

However, the interviews showed that this aspect is not consensual among all actors because, by establishing a deliberative council that counts on the participation of municipal representatives (mayors) and on some state representatives, some local actors argue that such council would somehow "dilute" the municipal autonomy and increment decision-making "centralization", since it would allow stronger influence from state actors. Moreover, the metropolitan region included the São Paulo State North Coast Region in a region that does not present conurbation features or other similarities to other Paraíba Valley counties.

Institutions and organizations: their articulation

Based on the institutions involved in this local conflict for access to water, it was possible analyzing the protagonists of the conflict. They belong to different institutions at multi-level spheres: municipal, regional and national *(Cf. Annex 2 - Water Policy and Technical Systems in Brazil; p. 40-49)*.

The Brazilian State Government Agency for Law Enforcement (state and federal) act to supervise the office of law and the act of public and private organs and institutions, State organs and institutions such as DAEE, SABESP, and CETESB, have tight articulation with the State Hydric Resources Bureau, which works as the state arm in the group. The CBHLN is composed of representatives from governmental and non-governmental organs and institutions; due to its profile, CBHLN is related to different action levels, since it would be an integration space. The representatives in the committee are elected by their pairs. Ilhabela municipal SMA is bond to Ilhabela City Hall, and to the Environment Secretary, which has an executive function, and is nominated by the mayor. The mayor is elected by direct poll in the county. Both are representatives from the City Hall and from the municipal SMA participating in CBHLN. The NGOs, with emphasis to those in Ilhabela County, also participate in CBHLN and act specifically in the topic, since they have close relationships with SSRH, the City Hall, The municipal SMA, DAEE, SABESP, CETESB, state and federal MPs. The neighborhood association takes strong actions along with the NGOs in Ilhabela County and inside CBHLN, in which the Sanitation Technical Bureau and the Executive CBHLN Secretary allow an open debate canal with the municipal and state institutions.

The actors addressed below have direct and indirect influence on the topic in this research, besides being involved in the conflict. Part of these actors was interviewed in order to provide data (14), the other herein used information resulted from interviews provided by the public communication means such as news reports, minutes, seminars, among others, so that they could be taken into consideration in the sociograms (6). Some actors were mentioned, but not interviewed (10) *(Cf. Table 1, p. 231)*.

Table 1 - Code of organizations and institutions

Code	Actors	Institutions
1	Unitau[b]	Regional University
2	NGO3[b]	Polis Institute
3	CETESB2	Environmental Company of São Paulo State
4	SRH-Other Municipality[b]	Municipal Water Resource Secretary of other municipalities
5	Mun. Gov. Ilhabela	Municipal Government of Ilhabela
6	PEI[b]	State Park
7	DAEE[a]	State Department of Water and Energy
8	Cultural Complex	Cultural Enterprise
9	Condominium[a]	Beach houses condominium
10	N.A - SP[b]	Neighborhood Association 2
11	N.A – AMAB	Neighborhood Association 1
12	SMAI	Municipal Environmental Secretary of Ilhabela
13	MPSP2[b]	State Public Ministry
14	SABESP2[b]	State Water and Sanitation Company
15	MPSP1	State Public Ministry
16	CBHLN1	Watershed Comitee
17	MPF1[b]	Federal Public Ministry
18	MPF2 [b]	Federal Public Ministry
19	CBHLN4[b]	Watershed Committee
20	CETESB1[b]	Environmental Company of São Paulo State
21	SABESP4	State Water and Sanitation Company
22	SSRH2[a]	Water Resource State Secretary
23	SMA-Caragua[b]	Municipal Environmental Secretary of Caraguatatuba
24	NGO1	Ilhabela Sustainable
25	NGO2	Supereco
26	SABESP3	State Water and Sanitation Company
27	SABESP1[a]	State Water and Sanitation Company
28	SSRH1	Water Resource State Secretary
29	CBHLN2	Watershed Committee
30	CBHLN3	Watershed Committee
Total actors		**30**

[a] *Information from one or more actors in this group may have been obtained through interviews, reports and from other information outspread means.*
[b] *We only used information about the relations with at least one of the actors in this group in order to make it possible elaborating the sociograms.*

Network and coalitions resulting from the conflict

The global classification of the groups is based on the understanding that the bonds of coalitions lie on how participants perceive the matter, on ideas to solve the conflict and on participation preferences (Sabatier, 1988, 1998; Massardier, 2006; Weible, 2006; Massardier, 2011) of groups focused on influencing the current frame. Figure 7.3 presents the division of actors composing the studied subsystem, who are divided around the core values.

It is possible noticing that the Public Prosecution does not make part in any of the coalitions because it must supervise law enforcement, since it is often accessed by actors in the resistance coalition when they intend to influence the decision-making process. Accordingly, we can define that the MP, mainly in this case study, works as a "policy broker", since it influences the decision-making, although it does not participate in the defense coalition. Based on the presented sociogram, we tried to conduct a conceptual association between the network describing the water access conflict in Ilhabela and the Advocacy Coalition Framework (Weible, 2006; Sabatier & Weible, 2007). The findings presented below result from the analysis applied to the information collected from interviews with actors in the regions.

The "water supply policy" was the subsystem defined for the current study, which includes the Municipal Sanitation Plan, the Watershed Plan, and the discussion spaces in the North Coast Watershed Committee. The relatively stable parameters based on what can be obtained through actors' reports and bibliographic references were 1) SABESP's permanence as the sanitation company working in the county, although without the proper service supply contract; 2) water availability is enough to meet the demand in Taubaté micro-basin - however, due to the great demand from summer houses, the consumption causes water unavailability to assist the local population; 3) the County had the autonomy to hire other sanitation companies before RMVP LN was formed - however, after RMVP NC was created, the county and SSRH were responsible for defining the guidelines to be implemented by the hired sanitation company, including the company that was supposed to provide the service *(Cf. Figure 7.2, Association of political coalitions resulting from the water access conflict in Ilhabela, p. 425)*.

Concerning external events, it is important to pinpoint that had "FEHIDRO resources" approvedby CBHLN to conduct an alternative construction project. The community tried but did not influence the ways to use the water resources in summer houses. There were changes in the governmental actors, such as the new Environment Secretary, among others; however, there was no change in matters concerning water access. Because of the "São Paulo Metropolitan Hydric Crisis", investments made by the sanitation company that were supposed to be used to solve the Ilhabela conflict were used to solve this new issue. Figure 7.3 *(Cf. Values, preferences, perceptions and beliefs shared within the coalitions, p. 426)* presents

the belief system components (Sabatier & Jenkins-Smith, 1993) of each of the identified coalitions.

The statistical analysis presented in Figures 7.2 and 7.3 shows the coalitions and their shared values (and other belief system components); coalitions are represented by the actors inside the dashed lines. Actors figured by blue nodes, corresponding to the "Participation for water right" core value, belong to the same opposition coalition ("pro-environmental-non-institutional" – green dashed line); they share the belief that water is a right, as well as their perception about a broader participation. On the other hand, actors figured by red nodes, corresponding to the "Water as economic resource" core value, belong to coalitions that have stronger influence on decision-making ("technical-administrative" – blue dashed line – and "political-technocrat" – pink dashed line), who share the concept that water is essential for the local economic development. It is worth highlighting that the "technical-administrative" coalition, composed of state actors, dominates this system.

According to Figure 7.2, the actors in the "pro-environmental-non-institutional" coalition advocate for the adoption of an alternative system to solve the problem – the pilot project to treat and distribute water (decentralized). The actors in the "political-technocrat" coalition believe that all users must be included in the official water supply system[9], whereas actors in the "technical-administrative" coalition share the idea that the inclusion of all neighborhoods in the supply system must happen through political instruments (social and differentiated fees, landownership regulations, and license to use water).

It is also important emphasizing that most actors in the "pro-environmental-non-institutional" coalition advocate for the broaden participation in decisions concerning the topic. On the opposite hand, actors in the "political-technocrat" and "technical-administrative" coalitions do not believe that participative processes, or that the broaden participation – with the inclusion of new actors –, would help solving the problem. Individuals drawn through clusters in Figure 7.3 belong to the same community and were grouped according to the analysis of interaction intensity. In other words, actors inside the same community (C1, C2, C3, C4 or C5) have high interaction of many natures, which are classified according to conflict, coordinated interests, mandatory coordination, information exchange, hierarchic coordination, and pure coalitions.

Concerning the type of relation set between actors in the sociogram (Weible, 2005), the "pure coalition" relations take place because actors share the same values and act together to make their opinions prevail in decision-making processes. Accordingly, it is possible noticing that either between state actors (SABESP, DAEE and SSRH), or between actors in CBH, NGOs and N.A – AMAB, there are "pure

9 Ilhabela City Hall along with SABESP implemented the "Se liga na Rede" program, which aims at subsidizing and encouraging houses and condominiums to get connected to the sanitation network (Ilhabela, 2016).

coalition" actions. The conflict relations emerge when there is value divergence between actors, and when there is not associated cooperation action. There is an opposition between actors belonging to different coalitions in this type of relation. An example of such distinction lies on the relation between actor 11 and actor 9, or yet between actor 24 and actor 21.

Actors who share, or not, the same values, but who work together have a "Mandatory Coordination" relation, as it happens among actors 15 and 13, 17, 18, or yet between actors 20 and 16, among others. These actors work together (Sabatier, 1998), but their relation presents "divergences" regarding the different positions and relations with the others. Because actors work in the same institutional space in this relation type, it enables learning about different coalitions. It was noticed through some narratives captured during the interviews, which are in total or partial disagreement with other actors, that there is a learning and reflection process about the new forms of action.

Actors who stand for different values, but who work towards a common goal, set a relation featured as "Interested Coordination", as it happens between actor 12 and 16, or yet among actors 29, 30 and 24, or 5 and 16, 29, 30, among others. This relation type happens between actors who, even if disagreeing about the core values, understand that, in order to reach an intermediate target, it is possible conducing associated actions. It is observed in the addressed cases, in which it becomes necessary going through intermediate phases such as associated actions, like the pilot project, in order to solve a problem or conflict. According to the theoretical reference, these associated actions in a sub-system, take place at the instrumental level (or secondary aspects) of belief systems (Sabatier & Jenkins-Smith, 1993; Sabatier, 1998; Weible, 2006).

The "Hierarchical coordination" relation, in which the action of an actor can be institutionally limited by another actor, happens between actors in the Ilhabela Environment Bureau and SABESP, Ilhabela City Hall and Hydric Resources Bureau, among others. Finally, the "Exchange of information" relations are those that happen between actors such as the Ilhabela Environment Bureau and DAEE, CBHLN and SABESP, among others. This relation type points out that information, such as the technical, political and action ones, can be exchanged between actors.

It is important to emphasize that the circumference of the circles representing the actors in the local water-access policy sub-system was selected to represent the "eigenvector centrality". This metric is based on the degree (number of relation for each node) of nodes that it is connected to; thus, it is possible getting a weighed centrality based on the degrees[10] of involved actors. Based on this metric, it

10 Degree is a simple count of the number of connections in each node. It is divided in "In-degree" in directed networks for the number of entrance connections and "Out-degree" for exit connections (Aldhous, 2012).

is possible to record the degree of importance of the node (or actor) inside the network (Aldhous, 2012). That is why it is possible to identify that some actors have certain degrees of importance in the coalitions. Some are more important than others depending on the size of the node and on the number of relations set in the network, as well as with whom they set relations. Therefore, some actors are more "central" due to their larger number of relations with other actors inside the studied sub-system, and because they set relations with actors who also have large numbers of relations.

If one analyzes the recorded result and the institutional capacity in influencing the decision-making process, it is possible to see that there is compatibility with the factors shown by the conflict. It is important having in mind that actors who are involved in the conflict through state institutions stand out inside the dominant coalition. Based on the analysis of the specific case, one can notice that actors in the county got less autonomy in decision-making about the water supply and sanitation topic after the North Coast insertion in the Paraíba Valley Metropolitan Region.

Network analysis of Ilhabela water conflict

After modeling of the network, presented in Figure 7.2, it was possible to obtain information on the role of certain actors in these social relations that make up the set of coalitions, as well as in relation to the density of these relations. The results pointed to the existence of five communities. The number of communities is strongly associated with the level of fragmentation of the network, that is, there are "groups" that are more closely interrelated among community members and less intense with actors outside the community.

In the case of the conflict studied here, we noticed that, despite a relatively small number of communities, when analyzing the overlap of these communities with the coalitions, there is some fragmentation in the network. The "Technical-Administrative" coalition consists mostly of actors from the C3 community, while the "Pro-Environmental Non-Institutional" coalition is composed mostly of actors from the C2 community and the "Political-Technocrat" coalition is composed of members of communities C1, C4 and C2, with greater emphasis on the C4 community integrally inserted in this coalition. This fragmentation points to a greater difficulty for information flow in this network, for example.

In this sense, the function of Brokerages is essential. Actor "11" has two important roles in this network. Firstly, it is important to remember and emphasize that this actor is the direct representative of the community that is subject to the lack of access to water during the dry season. In the network, this actor, according to the statistical analyses, presents a gatekeeper role between the communities C1 and C2, that is, through this actor, the information of the network flows from the

community C1, to the community C2. However, when focusing on the role of this actor within the "Pro-Environmental Non-Institutional" coalition, the actor starts to develop a representative role, since the actor is responsible for flowing information from this coalition to the other coalitions.

Actor "30" represents important roles of representative and gatekeeper, even stronger than the actor previously discussed, both in relation to the coalition and in relation to the communities. He is an actor who, at the time of the study, held a strategic position in the CBHLN in relation to the conflict, since it was through this actor that the proposal for an alternative sanitation system was presented and articulated. It is important to emphasize that this actor, due to his role in the CBHLN itself, also plays an important liaison role by allowing the flow of information between actors of networks other than his own, as well as between the "Political-Technocrat" and "Technical-Administrative". Actor "16", also a member of the CBHLN and playing a strategic role for the full functioning of this institutional space, besides playing roles of Representative and Gatekeeper, also performs the coordinator role, as it is mainly through this actor that flows the information between the actors of the community C2 and inside the "Pro-Environmental Non-Institutional" coalition.

Finally, another actor who stood out in the function of brokerage, was the actor "22". This actor played the role of Representative, since this actor acts in the SSRH and is the channel of communication between different levels of performance (state, regional and local). It is through this actor that information flows from actors like the Secretary of Water Resources of the State of São Paulo to the actors of local and regional level. It is also through the actor "22" in his gatekeeper role that the members of other communities manage to reach the actors of the C3 community.

Conclusion

It was possible to conduct an analysis of the water policy coalitions in the region based on the case study about the access to water in Ilhabela. The political coalition analysis enabled identifying the governmental and non-governmental actors involved in the water access topic in Ilhabela County. The choice made for the case study (location facing conflict due to the water transposition between the two micro-basins as an alternative way to catch water) allowed presenting an overview of the matter.

This summary went beyond the local issue, because it highlighted regional and state actors that also act in the topic related to the conflict, as well as to other similar conflicts in the NC. The herein assessed data and information show a coalition composed of state actors that have more power than others in the decision-making process. This mainly happens due to processes that end

up reducing county and civil society participation. The relevant role played by state actors, which stands out from the definition of Paraíba Valley Metropolitan Region, goes against the decentralization principals set either by the National and State Policies concerning the Water Resources sector and the Sanitation sector. It was possible to note this from the follow-up of the proposal of the alternative sanitation system presented by the Pro-Environmental Non-Institutional coalition which was not implemented from the decision taken between actors of the "Technical-Administrative" coalition, composed of actors of the dominant coalition and that act at the state level.

The alternative was presented in the form of an argument that the area of the conflict was already included in the SABESP Action Plan and therefore could not be met by projects executed with FEHIDRO. Also at the state level, the decision to form the metropolitan region has the potential to reduce the autonomy of the municipality in its responsibility role with the sanitation services in determining that this decision can be taken from a development council composed of actors of RMVPLN (municipalities and state actors). The outcome of this case points out that, despite the efforts of local actors to seek alternatives within the institutional rules to resolve a conflict, the state bureaucracy is still used as a way to maintain the centralization of power in order to influence decisions in some state actors. With this, the problem in the region still persists.

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Part 3

Hydrocracy and the Water Crisis

8 Activists and the Hydrocracy

9 Water transfers and institutional standstill

10 Reinventing water conservation

Social organizations for water regulation in Mexico.

ACTIVISTS AND THE HYDROCRACY

Water conflicts in the unfinished democratic transition context of Mexico

Amaël Marchand

Introduction

The notion of ecological transition is subject to strong political antagonisms in Mexico, in a context marked by the authoritarian and centralized clienteles' system crisis, implemented after the revolution. The issues surrounding the sustainable development offer political parties and stakeholders outside the public bureaucracies opportunities to participate in the discussions around public policies and try to influence them. The situation is, however, paradoxical in the urban water management environment. The omnipresence of references to sustainability by all the protagonists in the discussions, do not lead to a significant transformation of the management modalities of the urban services and infrastructures. This chapter questions the mechanisms that make ecological transition a central element of political legitimacy, without turning it into ambitious and effective public policies. In particular, it shows how new stakeholders' problematic integration in the water federal policies' subsystem led to its polarization, between two coalitions: one focused on management efficiency, and another pro-social environmentalist that seeks to transform it in depth. Far from providing a regulation of conflicts framework suitable for a consensus formulation, the partial implementation of instruments for a participatory water management has contributed to increase the oppositions. This study, however, insists on the role of certain intermediaries in public policy (*policy brokers*), inter- or intra-coalition, whose marginal impact in public policies shows the maintenance (despite its deep legitimacy crisis) of a centralized and authoritarian system.

In March 9th, 2015, legislative discussions about the General Water Law (*Ley General de Aguas*, LGA) are suspended for indefinite time. It's an unexpected formal decision that marks the turning point of a long controversy. LGA should redefine the legal framework for water management in Mexico, entirely replacing the National Water Law (*Ley de Aguas Nacionales*, LAN), which has been in force since 1992. Its official goal is to establish the necessary measures to implement the Human Right to Water *(Derecho Humano al Agua)* integrated to the Mexican Constitution three years earlier, in February 2012. During his official speech, the President of the Parliament's Board Policy Coordination explains that the suspension of discussions about LGA is due to "the disinformation that has motivated some politicians in

campaign to take it (the subject) as a flag to confuse others." (Aristegui News, 2015). Fully endorsing this point of view, Representative Kamel Athié, Chairman of the Committee on Water Supply and Sanitation in the Parliament, said in a press conference: "Actually here, there has been an abuse of lies saying that Water will be privatized"(*Ibid).* Both are members of the Institutional Revolutionary Party (*Partido Revolucionario Institucional,* PRI), to which also belongs the President of the Republic. They fear a violent dispute if the discussion reaches the Parliament, which would give much prominence to certain members of the Left opposition who seek to absolutely prevent the adoption in haste of the law proposed by the powerful federal bureaucracy responsible for the management of "national waters" (the National Water Commission (CNA): "We declare ourselves to be on high alert… There are going to be surprises; nothing can be ruled out, even to get to take the tribune by force" (Press Conference, March 4th, 2015), had warned Aleida Alavez of the Democratic Revolution Party (*Partido de la Revolución Democrática,* PRD). Five days earlier, on March 4th, the San Lázaro Legislative Palace was surrounded by an imposing police deployment, in order to prevent protests organized by opponents to the CNA bill project, to disrupt the work of legislative committees' reviewers. Within the enclosure, Aleida Alavéz carried out a press conference in support of the demonstrators during which she alerted on the environmental and social risks that represent, according to her, a law that establishes certain licenses of water sources for thirty years to private companies and favors the construction of large infrastructures to transfer water from one watershed to another. At the same time, Javier Orihuela, also a PRD deputy member declared: "PRD does not agree with the National Water Commission proposal; in PRD, we already have a very clear view, we are going to defend the initiative proposed by the social, environmental and academic organizations" *(Ibid.)*. Both believe that it is necessary "to recognize the social participation" to develop a law that guarantees access to water, reset the hydrological balances, and demand the implementation of "hearings to gather the rich proposals of various organizations throughout the country" *(Ibid.)*.

Never in Mexico's post-revolutionary history had a federal law for to the national water policy unleashed a public controversy of such magnitude. According to the authoritarian tendencies of the political regime established after the revolution, water federal laws are directly produced by the executive branch since 1929. The 1992's National Water Law was the first to cause a public debate, but this was relatively limited at the parliamentary level and did not prevent its enactment. In contrast, the debates surrounding LGA started three years before legislative discussions within the framework of multiple meetings mainly organized in universities with the aim to "generate proposals" for the implementation of the Human Right to Water. The controversy has gained even more visibility between mid-2014 and 2015 to become a mediatized subject, mentioned by a number of press articles and interventions in the main radio stations, as well as

in some television newscasts. A particular point to mention is the participation of stakeholders whose profile does not correspond to the politicians or high officials usually involved in the discussions on the federal water policy. In fact, contrary to what happened in the past, the proposed "official" law developed by the Federal Executive is not the only one to be submitted to the Parliament in March 2015. It is in competition with a "citizen proposal" developed by activists belonging to a set of non-governmental organizations, associations, representatives of social movements, and of university researchers. The debate is quickly polarized around these two antagonistic proposals. The "official" proposed law drafted by the CNA legal services seeks, according to its advocates, to improve the regulation of existing practices, with the aim of bringing a more efficient water management back. This means, among other things, to consolidate a regulatory framework that is conducive to private investment in water management by creating a regime of concessions and updating the regulations applicable to the construction of large hydraulic works. In contrast, the citizen's proposal seeks to radically change the operation of water management in the country at both technical and political level. Among its strongest arguments, there are the strict control of private companies involved in water management and the restriction of new inter-basins, in order to respect natural hydrological cycles. It also contemplates that the country's water policies are designed by participatory instances with a real decision-making power and adequate budget, reducing CNA's role to a technical executor.

The legislative debate suspension, initially presented as a victory by the defenders of the citizen law proposal, ultimately resulted unsatisfactory for both parties. Although the adoption of the official law initiative was stopped, activists failed to implement any of the public policies they considered necessary. This chapter seeks to understand the socio-political process that has led to this situation of *status quo*. Its main hypothesis is that, in spite of not having the official and legal power to make decisions, water activists contribute to destabilize the centralized and authoritarian political subsystem, which subsists in the development of water federal policies. This destabilization is mainly translated by the legitimacy loss of water federal bureaucracy, as well as some of the management instruments that it promotes, in particular private participation and the large hydraulic infrastructures. Activists contribute to this destabilization through the promotion of water conflicts, the contentious appropriation of public policy instruments, the formation of a multilevel coalition and their linkages with intermediaries, members of the country's political elite. Its incidence in water federal policies, however, remains residual. Thus, the conflictive *status quo* situation can finally be explained by the permanence of a centralized and closed political structure that does not favor a consensus construction, despite the multiplication of stakeholders involved in the discussions.

Out of the technocratic or local areas, the water conflict visibility allows the study of new stakeholders' integration in the discussions surrounding water

federal policies in Mexico. In destabilizing the institutions' routine operation, these conflicts acquire a strong power in public relations, rather than be hidden. The analysis focuses on water protagonists' relational space (Lorrain & Poupeau, 2014), with the aim of studying a crisis situation rather than a group or a specific organization. Water conflicts are commonly attributed to the increasing scarcity of the resource. According to this perspective, political tensions are the result of an increasing water demand, in relation to the available quantity due to factors such as global warming, pollution, urban expansion, and the development of extractive or industrial activities. Some studies have emphasized the institutional dimension of this conflict, for example, by showing how decentralization leads to struggles between different levels of government (Perló & González, 2005). These studies also show how the political fragmentation (Kloster & Alba, 2007)- that is to say, the loss of PRI monopoly - has opened up politic opportunities for social movements to forge alliances with left parties such as PRD, or more recently MORENA. However, few studies show these alliances' structure, the conditions on which they are based, the processes that led to their creation, and their implication in public policies. On the other hand, many of the activists involved in LGA discussions built their political legitimacy participating in local conflicts, before entering the national arenas. Few studies take into account this multilevel dimension. It is the task undertaken by this chapter to develop a sociological approach of water conflicts in Mexico and their impact on public policy. On the basis of the debate that broke out about LGA and its relationship with two local conflicts, the analytical framework of the Advocacy Coalition Framework (ACF) supplemented by the sociological contributions of public policy instruments allows us to investigate the participation of new stakeholders, their conflictive integration and incidents in water public policy processes, in particular regarding the Water Human Right implementation in Mexico.

The ACF interpretative model considers public policies as the result of often conflicting interactions between a multitude of stakeholders grouped in opposing coalitions (Sabatier & Jenkins-Smith, 1993; Sabatier, 1998). The ACF relational perspective is relevant in determining the role of the interactions between stakeholders in dispute during the public policy processes, without discarding the existence of powerful sectoral elites (Bergeron, Surel & Valluy, 1998). This enables developing a socio-political analysis that goes beyond the complaint of the public authorities' authoritarianism, or, on the contrary, the celebration or anticipation of a supposed democratic governance. It also enables going beyond traditional approaches focused on the public policy ''iron triangles" composed of administrative agencies, legislative committees and a group of interest, unlike ACF which is interested in more complex political subsystems composed of "hundreds of active stakeholders from all levels of government, multiple interest groups, the media, and research institutions" (Sabatier & Jenkins-Smith, 1999).

As for sociology of public policy instruments, it allows to emphasize the stakeholders' proximity led by ACF, which must not lead us to hide the weight of technical and institutional systems (Lascoumes, 2004; Lascoumes & Simard, 2011) governing the water sector, even more when these are at the center of the debates studied. The large hydraulic networks, private participation in urban services management, citizen participation or watersheds integrated management constitute public policy instruments used by the authorities to organize social relations and operationalize the government action. The technicality of the instruments is inseparable from its social effects, that is to say, its ability to guide collective and individual practices. The instruments "favor certain stakeholders and their interests, and exclude others, coerce stakeholders and provide them with resources, and transmit a representation of problems (Lascoumes, 2004). They, therefore, can alter power relations' effects within and between stakeholder coalitions studied by ACF (Halpern, Lascoumes & Le Galès, 2014).

This study combines three methods: a qualitative study of the stakeholders' profile, their political positions and interactions, based on 13 semi-structured interviews, participatory observation and documentation; a study through statistical classifications of a database with information about the discourses, the social characteristics and the links of 34 individuals; and a social networks analysis.

The federal water policy in Mexico: A centralized subsystem destabilized by the conflictive integration of new stakeholders

According to the ACF, a political subsystem is defined "by territorial limits, a central theme, by its hundreds of participants from different levels of government, multiple interest groups, media and research institutions" (Weible and Sabatier, 2006). However, the disputes surrounding the the General Water Law (LGA) reform in Mexico were not developed in a territory where its boundaries can be defined with precision. The range of application of this federal law extends to the whole of the national territory. This, however, does not mean that the political subsystem territorial boundaries studied are those of the Mexican Republic, or that their dynamics of power do not show territorial logics. These ones are in fact in the centralization of formal and legal power in federal public policy, and in the hands of the deputies Chamber, the Senate, the President of the Republic and the National Water Commission (Conagua), as well as in the geographical concentration of these institutions in Mexico City. Considering that the political subsystem boundaries coincide with the enclosure walls of these official institutions would hide the participation of individuals not linked to that matter, and who not necessarily reside in the capital of the country.

In fact, stakeholders involved in local water conflicts in different parts of the country participate in LGA discussions inspite of not having formal and legal power

to make decisions in this regard. The study focuses in particular on the relationship between two local conflicts and the debates about the LGA. The first conflict was developed between 2008 and 2012 in a peri-urban zone situated in the south of Mexico City, in the vicinity of Lake Chalco. It opposes universities, associations and representatives of neighborhood committees to CONAGUA, about the management of large hydraulic infrastructures. It is developed in a local context, marked by repeated floods, cuts in the water supply and soil subsidence increased by the groundwater massive extraction. The second conflict takes place in the peri-urban areas of Saltillo city, mainly in the course of the year 2013, and confronts experts and representatives of a social movement with the municipal presidency, the public-private company in charge of the urban water service and, to some extent, CONAGUA. This conflict arose after problems of shortage and an increase in water service rates. Analyzing the relationship between these two conflicts and the national debates about LGA that took place from 2012 to 2015 allows us to have a multilevel perspective and to take into account territorial logics. However, because of its multifaceted nature and its imprecise borders, the territory does not appear to be a sufficient criterion to clearly define the political subsystem studied.

The other two criteria proposed by the ACF for the subsystem definition are "the central theme" and the stakeholders. This is defined by what is at stake within its innerness, and by those who participate in this game. Despite its apparent simplicity, this definition raises many questions. It first presents the difficulty of defining what is at stake, on the basis of local conflicts whose problems are necessarily multiple. However, the methodology implemented in this chapter does not focus on the internal dynamics of local conflicts, nor in their causes, but it analyzes their relationship with the national debates about LGA. In this specific context, what is at stake is the definition of federal water policies. Having said that, the delimitation of stakeholders in the subsystem is still more complex than it seems. All stakeholders actively participating in the struggles to define these specific public policies, are in fact part of the subsystem, regardless of their institutional or territorial affiliation. However, stakeholders' profile in the subsystem has radically changed over time. The monopoly exercised by engineers of the centralized water bureaucracy directly linked to the Presidency of the Republic is in crisis. Actors with heterogeneous features are now involved in these disputes: congressmen, senators, international organizations, NGOs, State departments, municipal officials, academics, consultants, associations, social movements, private companies and foundations. This subsystem complexity is due in large part to reforms in decentralization, liberalization and, subsequently, the transition toward a sustainable management introduced since 1970 *(Cf. Box 1; p. 251)*. In addition to the technical and organizational transformations, the reforms and the crisis of the federal bureaucracy changed the sociological composition of the stakeholders involved in the discussions about federal water policies.

1. From bureaucratic centralization to a decentralized, liberalized and sustainable water management in Mexico

If the debates on the last LGA reform began in 2012, understanding the current subsystem composition and its relational structure requires a historical look that goes back to 1926. The National Irrigation Commission was created that year and replaced in 1947 by the Secretariat of Water Resources (*Secretaria de Recursos Hidráulicos,* SRH). Between 1926 and 1976, a continuous process of Water centralization management was developed in Mexico, in the hands of a powerful water bureaucracy based in Mexico City, which helped to consolidate the post-revolutionary State (Aboites, 2009; Wester, Rap & Vargas-Velázquez, 2009). The borders of water subsystem federal policies were then those of the centralized bureaucracy, directly linked to the Presidency of the Republic, its main actors, the State engineers and the large hydraulic infrastructures, the technocratic management, and the fundamental public policy instruments.

The situation abruptly changed in 1976 when the SRH was merged with the Ministry of Agriculture. One of the main reasons invoked to justify this institutional adjustment was to limit investments in infrastructures that began to be considered at that time as excessive (Wester, Rap & Vargas-Velázquez, 2009). The end of SRH is thus one of the first important questions of major infrastructures, from an accounting point of view, about restriction of public spending. Resulting from the public finance crisis and conflict at the top of the State, the difficulties that shook the water bureaucracy between 1976 and 1989 have also marked the end of the quasi-monopoly exercised by engineers of the State on the federal water policies (Aboites, 2009; Wester, Rap & Vargas-Velázquez, 2009). The CNA creation in 1989 is made in large part thanks to loans from the World Bank, seeking to promote a policy of decentralization and liberalization of water management. This renewed water bureaucracy was very different from the former SRH. It does not have the status of Secretariat, having fewer resources and officially putting an end to the policy of centralization in water management (Vargas, 2002). The growing influence of administrators and politicians without an engineering profile during those years, as well as the pressure exerted by international organizations, were the first signs of the subsystem complexification in water federal policies.

Changes in the public intervention modalities initiated during the 1970 decade were institutionalized during the 1990s. The reforms implemented show the Mexican State's will of being at the top of new forms of governance promoted by large international organizations, such as the World Bank and the International Monetary Fund. They enroll in the global movement of traditional ►

bureaucracies' legitimacy loss and in "the effort to take into account extensive networks of heterogeneous actors (public/private, for-profit, for-non-profit), in order to coordinate them better" (Lascoumes & Simard, 2011). Reforms formally comply with the vision saying that the State should guide the policy (rather than direct it) with instruments that define procedures more than preset objectives. Water management by public authorities was then divided into a complex institutional architecture with different levels (federal, state, regional and municipal), at the same time that were created institutions of participatory management at the level of river basins and groundwater (Vargas, 2002; Rap et al., 2004). Similarly, a regulatory framework was elaborated to favor the private participation in urban services management (Wilder & Romero Lankao, 2006; Wilder, 2010).

The social trajectories of the new protagonists in the water federal policies subsystem allow us to understand the socio-political processes that led to its complexity. This is, for example, what the trajectories' study of the citizen law proposal's promoters reveals. For the majority of the activists interviewed, the organization of the Fourth World Water Forum in Mexico City in 2006 represented an important moment in their biographies: "It was very interesting because what we did in Mexico was a formation and learning process on the subject before the forum. There were many workshops, seminars (…) Facing the conjuncture of the world water forum, it became evident to the different organizations that were also working on the theme that all those conflicts (agrarian conflicts, the forests, the pollution problems…) were linked to water" (Claudia C., COMDA, January 2013). Activists who already had some experience in the water sector found new opportunities in a context marked by a sustained media interest, as well as by the multiplication of labor proposals and available funding, linked in part to the foreign cooperation or to international organizations. On the other hand, activists who had little or no experience in the subject began to specialize in the specific issues of water management in Mexico, during the Forum readiness. This event effectively reinforced the political visibility of water beyond the technocrats' arena, technicians and engineers from the public sector or specialized companies. The Forum gave the Mexican government an international platform to present itself at the forefront of the transition to a decentralized, participatory management and a sustainable use of water. Despite the distance between the official texts and effective management practices, the theme of the Forum, *Local solutions for a global challenge*, gave visibility and a great space for water policies discussion to private companies and "civil society representatives", mostly academics, NGO's and associations (Fourth World Water Forum & National Water Commission, 2006), meanwhile the *Alternative days of Water* were carried out, organized by academics, NGO's and associations.

The pre and post-World Water Forum periods were also favorable times for the progressive appropriation (by activists) of the multitude of public policy instruments, specific to the water sector: "You have the Basin Councils and its auxiliary bodies: the basin committees, watershed commissions and the groundwater technical councils COTAS *(Consejos Técnicos de Aguas Subterráneas)*. Everything is done for you to get confused each time. Understanding it all this takes years. The first years of work were dedicated to understanding the institutional apparatus and the ways of impacting to consolidate the civil society participation" (Nathalie S., Fan Mex Director, January 2013). The creation of Amecameca and la Compañía rivers watershed Commission, in 2008, by researchers from the UAM belonging to a research center specializing in sustainable development is an example of a public policy instrument appropriation. This committee aims to use participatory mechanisms provided by the National Waters Law, to propose sustainable solutions to the many problems caused by water management in the peri-urban areas of Mexico City, located in the vicinity of Lake Chalco. After four years of multidisciplinary research (hydrology, environmental engineering, sociology and geography) and consultation with competent local NGOS, neighborhood committees, municipal authorities, representatives and employers, the watershed commission, in 2012, announces a "water plan" that summarizes its proposals: "We did 80 participatory planning meetings, tours, we got money from the Aronte River Foundation and we made it happen. We did it as a commission because the river basin commissions have the power to adopt its own water plans; they have the seals of all the Ejidos (a system of communal land tenure in Mexico), of all the authorities, everyone agreed and signed it, they covered 1140 square kilometers." Despite being legally recognized as a consultative institution, the basin Commission's proposals were immediately discarded by CNA officials for being inconsistent with the policies designed by its engineers, in accordance to the guidelines determined by the federal executive: "a management program or a planning instrument has to forcedly come in line with the National Development Plan. If not, that is not planning, and we are lost. Oh no, I do mine! [Imitating the basin commission leaders.] Well, what did you lined it up with? With your own desire? No, it's not like that!" (Lydia M., CNA, February 2014). The instruments ownership of water participatory management by activists leads them to directly confront the maintenance of a centralized, bureaucratic and authoritarian system, in contradiction with the multiplicity of partitive systems provided by the law. It also leads them to confront the maintenance of federal water policies focused on the management and the extension of large water infrastructures, contradicting the transition toward a sustainable management also provided by the law.

Like the World Water Forum in 2006, the year of 2012 is a new moment of rupture in the trajectory of citizen law proposal's future promoters. Two main factors converge at that time. First, the Human Right to Water is integrated to

the Mexican Constitution in February 2012, and the General Water Law should be prepared with the official target of returning this applicable law. In the second place, 2012 is also the year of another constitutional reform that establishes the existence of a new participatory political instrument, which is not exclusive to the water sector. This is the "citizen law initiatives" that allows Mexican citizens to present a bill to the Congress of the Union, if they are able to raise the equivalent of 0.13 % of the nominal voters list, that is to say, around 130 000 signatures. Given the CNA rejection to take into account the recommendations contained in the water plan drawn up by the Amecameca and la Compañía Rivers Basin Commission, its leaders decided in coordination with other organizations, to convoke a national congress called "Basins and Cities" in December 2012, seeking to "generate proposals for the General Water Law". At the end of this congress, which brought together more than 420 academics and ''representatives of the organized civil society", a decision was taken to develop a citizen law proposal and to collect the necessary signatures to be submitted to the congress. One of the objectives of the proposal is to give more power to the participatory water management by making their proposals obligatory applied by public authorities, and in particular by CNA. The activists subjects of our study, because of not being able to have an impact on local water policies, seek to advocate at the federal level not only by self-appropriating the participatory tools provided by law to that effect, but also by trying to change the law to increase the political power conferred by these instruments: " We must ensure that the basin councils are the ones who plan, and CNA must execute the Basin Council decisions. This is the meaning of the law we are writing" (Nathalie S., FAN MEX, 2013).

The approach through public policy instruments does not have to hide the conflict dimension of the new stakeholders' integration process in the water federal policies subsystem. In fact, in the case of "Chalco Lake", the appropriation of public policy instruments by activists is conflictive from the start. The Amecameca and la Compañía Rivers Basin Commission establishment is used by them to oppose the expansion of large infrastructures provided by the CNA on the outskirts of Mexico City. In the same way, the use of the mechanism of citizen law initiatives has an explicit goal of limiting the federal bureaucracy power, thus entering into direct confrontation with their interests. On the other hand, the instruments' definition and implementation is what is at stake in certain conflicts. It is the case of participatory management systems in the conflict "Chalco Lake" and in the discussions around LGA. It is also the case of the private participation in the urban water services management through the creation of public-private partnerships in the conflict "Saltillo", also present in the debates surrounding LGA. The diversification and multiplication of stakeholders involved in the discussions about federal water policies, led to the rise of dissident political positions, in relation to the guidelines promoted by the water bureaucracy. This does not mean, therefore, that

the intervention of all protagonists in the conflicts is done in a chaotic manner: not only public policy instruments structure these interventions, but also the alliances that the actors forged among themselves in order to be imposed in the relations of power owned by the federal water policies subsystem.

Managerial visioning or social environmentalism: A subsystem polarized between two opposing coalitions

Two sets of conflicting beliefs about water policies, particularly in the urban areas, were identified in a first time, thanks to the qualitative research. However, these beliefs are in general prior to the debates studied and remain after them; they are relatively stable in time and correspond, therefore, to the policy core belief referred to by the ACF. The first set of beliefs is described here as management, and the second as pro-social environmentalism. The qualitative research also made evident the existence of certain individuals, minority groups, that are not clearly affiliated with any of these two beliefs in the majority.

In 2017, during a presentation on the Human Right to Water at the Colegio de Mexico (COLMEX), Ramon Aguirre, Director of the water supply and sanitation operator in the City of Mexico, commented the discussions that occurred about LGA two years before, concisely briefing up the beliefs described here as "management": "It has become clear that the Human Right to Water theme requires investment, there is a popular belief that says God gives water but not the tubes. [The Human Right to Water] has not served anything more than to the streets, the protests, but public policies have not been effective (…). When you speak about the service cost, you must first see which type of service you refer to. A 24-hour service, with drinkable water… A first world class service of is an expensive one (…) In the case of the country, in the Mexican Republic, we have the "no cost for water" culture (Ramon Aguirre, SACMEX, February 9th, 2017). According to the management beliefs, one of the main problems the urban water sector faces is its financing: "someone has to pay". Urban expansion and the development of industrial activities effectively impose a costly infrastructure construction to meet constantly increasing needs. Beyond the infrastructure construction, finance, its maintenance and good operation represent an even greater problem. This is mainly due to the non-payment" culture of the users, as well as the reluctance of municipal authorities in charging and applying adequate rates for electoral reasons. Urban operators do not have the resources to carry out the necessary investments. Users, particularly the poorest, suffer the consequences of this situation: a poor-quality service characterized by cuts in the supply and a non-existent or failing sanitation.

Social environmentalism pro-beliefs are based on the idea that the water policy should not give priority to economic criteria that generate depletion of the

resource and inequalities in water access: "It is not a matter of thinking solely on water and sanitation services (…) The human right to water and sanitation can be achieved only if the complete water cycle is considered, as well as the systemic and integral water management, thinking in the conservation of watersheds, and in water non-pollution, which is very different to what is being providing in the CNA." (Nathalie S., Director of Fan Mex, January 2013). The water management has, on the contrary, to be integral and sustainable to promote an environment-society balance, thus replacing "the old extractivist model and replacing it by one of the management cycles that respects life, natural rhythms." (Pedro M., UAM, March 2014). According to these beliefs, the main problems affecting the urban water management come from privatization and trading systems that condition the access to the resource "in quality and quantity for life and human development, omitting their cultural importance" (Bustillos & al., 2015). This rationale favors resource grabs by private companies, either to manage urban services by imposing excessive fees to users, or to develop polluting industrial activities and high water consuming. In general, all practices that were contrary to the integrated water management, depleting water resources and ecosystems that infringe the rights of indigenous or "urban-popular" populations, represent a serious problem. It is the case of mega-water projects, in particular transfers. Finally, a water management problem is the limitation of citizen participation in decision-making related to the integral water management. The lack of democratic control and accountability allows public authorities and private companies to evade their responsibilities.

The quantitative methodology developed in the Bluegrass project framework *(Introduction; p. 12-61)* allows to examine in detail the discourses linked to the beliefs previously qualitatively identified. The discourses show how the general order beliefs that are relatively stable in time (about management and pro-social environmentalism in this case) are translated into more circumstantial preferences about certain specific public policy instruments that belong, according to the ACF, to the secondary beliefs category. The discourses also show how the general order beliefs correspond to certain argumentative strategies. The statistical analysis of a database that includes information on 34 individuals allows (by means of a factorial mixed classification and ascending hierarchy) us to group their discourses in two different classes, corresponding to the two sets of beliefs, thus confirming the qualitative observations.

Class 1 brings together pro social environmentalism discourses, which are relatively homogeneous. It corresponds to three distinctive traits: an alarmist vision of environmental issues and access to water, a critique of the official institutions and in particular of the federal State, and an open opposition to a management that includes the private sector (even in the form of a public-private partnership), or inspired by private management methods (full cost pricing and self-financing services). Class 2 brings together management discourses. Three distinctive

factors characterize them: a globally positive vision of the official institutions role (in particular the federal government and the States), the priority given to water increase in volumes available for human activities with the objective to sustain economic growth, and a positive perception of the private sector inclusion in water management or about importing management methods from the private sector.

A second classification performed only taking into account views about the effectiveness of some public policy instruments helped to confirm and refine the dichotomy between the two identified antagonistic discourses. Among the 18 individuals classified with a pro-social environmentalism discourse, 15 stand out for their rejection of the full water cost pricing, of self-financing water services and public-private partnerships. On the other hand, they are characterized by their support for the strengthening of the citizen participation mechanisms and of the basin committees. They represent the activists' most radical and visible fraction for the right to water, clearly anti-commercialization and privatization of the resource, and strengthening citizen participation. The 3 remaining individuals with a pro-social environmentalism discourse share most of the views about the policy instruments of the 15 first individuals but are characterized by missing responses to the questionnaire. These missing answers are due to the fact that their more ambivalent positions could not be condensed in positive or negative answers to the questionnaire, or they could not give any answer to a theme. These three individuals are significant for a more pragmatic fraction of water activists but whose positions are less visible. For example, they can consider that under certain circumstances, it is possible to ensure the human right to water through the service's self-financing, or that promoting (as the main solution) participatory instances to the detriment of federal bureaucracy is a too idealistic political position. On the other hand, the classification that only takes into account views about the effectiveness of public policy instruments, divided individuals with a management discourse into three distinct groups. The first group brings together senior officials from the federal bureaucracy, a representative of the private sector close to the executive power and to a female academic, clearly opposed to the strengthening of citizen participation mechanisms, but favorable to the private sector participation, to the full cost pricing and self-financing. The second and the third group bring together individuals in favor of water services full cost pricing and self-financing, but not necessarily opposed to strengthening participatory mechanisms. These two groups are mainly distinguished by the number of missing responses, without which this difference could not be clearly interpreted. These groups bring together the less authoritarian fraction and more pragmatic individuals with a management discourse, openly favorable to the private sector or to its management methods importation.

Alternating between the classification based on discourses and the classification solely based on the opinions about public policy tools allows us to refine the analysis. In fact, the statistical classification based on discourse evinces an antagonism

between two groups but hides the discourses that do not fully fit in this division. It is necessary to remember that the distribution of individuals in the database into two groups is the result of a statistical process that has limitations. The missing answers to certain questions due to lack of data and the limited number of individuals in the database did not allow us to interpret classifications with a larger number of classes *(Cf. Box 2, below)*. However, the high number of answers to questions about public policy instruments made it possible to outline a subtler range of positions. In the same way, the individual analysis of the questionnaires shows that certain actors may have disparate positions that do not correspond to the opposition between class 1 and 2 of the discourses. The qualitative research has also put in evidence the existence of a third, more pragmatic discourse, which is not inscribed in the antagonism between management and environmentalism. The fact that they are less visible in the public space is a sign of polarization of the debate.

2. Building the database

First, a list of individuals involved in one of these two local conflicts studied and in the discussions about the LGA was established. In a second moment, this list was completed to include the most influential stakeholders in the LGA debate. The first criterion used to identify these influential actors was based on the individuals' reputations: thanks to various sources (interviews, newspaper articles, publications, activists and university publications), it was possible to build a first list of people considered as important for the development of the dispute. The second criterion is an institutional approach. This corresponds to agents that, by their political responsibilities, place of work, or their official function, have a greater incidence. The final list includes deputies, senators, senior government officials, academics, NGO leaders, consultants, representatives of social movements and entrepreneurs. The database contains information obtained on the social trajectories, discourses, and the contacts of 34 individuals involved in the controversy surrounding LGA, 7 of which are also involved in the "Chalco Lake" conflict and 5 in the Saltillo conflict.

Crossing the individuals' career paths information with their discourses also allowed us to go further in the analysis. The distribution of individuals into two classes according to their discourses, coincides almost completely with the division between the insiders close to the official institutions that concentrate all the formal and legal power to make decisions (discourse class 2/ management beliefs), and the outsiders who are in a position of exteriority with respect to these institutions, deprived of official powers in water management (discourses class 1/ pro-social

environmentalism beliefs). Individuals with a management discourse mostly belong to federal institutions with formal authority in the water management sector: CNA, the Mexican Institute of Water Technology, Deputies Chamber Commission for Drinking Water and Sanitation, Deputies Chamber Commission for Hydraulic Resources, and Senate Commission for Hydraulic Resources. Three researchers who have authority positions also have this kind of speech, as well as two directors of urban water operators. On the other hand, individuals with a pro-social environmentalism speech all belong, with the exception of two federal deputies of the Left (Morena and PRD), to institutions whose official powers in water management are very limited, and these are mainly academics, activists, and NGO's leaders.

However, the fact that certain stakeholders share general beliefs, second order beliefs and discourses in terms of public policy is not enough to consider them as part of the same coalition. It is necessary, therefore, that their common beliefs are translated into consolidated alliances in order to influence public policy processes (Weible & al., 2011). For this reason, we have completed the discourses' qualitative observations and the statistical classification with a network analysis that allows us to display the effective linkages between stakeholders (Considine,Lewis, Alexander, 2009; Le Naour, 2012; Mercklé, 2011) *(Cf. Figure 8.1, Sociogram of effective relations between stakeholders, p. 427)*.

The network analysis results are graphically represented in a sociogram. Each individual is represented by a circle whose size varies depending on its centrality in the social network, and by the name of the institution to which it belongs. Those with a management speech (grouped by a dotted blue line) are located to the left of the chart, and individuals with a pro-social environmentalism speech (grouped by a dotted green line) are all located to the right. A first observation concerns the correspondence (almost exact) between clusters (represented by clouds of different colors) and stakeholders' discourses. The majority of individuals with a management speech are grouped in two clusters located to the left (G3 and G4), while the majority of individuals with a pro-environmentalism speech are grouped in three clusters to the right (G1, G2 and G3). This means that people with similar discourses have more links between them. The social network studied is therefore strongly polarized in terms of discourses. The division between individuals with a management vision and pro-social environmentalism individuals, corresponding to the division between insiders and outsiders, does also impact on the dichotomous structure of the social network studied. This polarization is significant for the maintenance of a functioning that is centralized, authoritarian and closed on federal water policy in Mexico. The "insiders" do not need to have strong links and even less consensus with those who are outside of the official institutions to implement a public policy. In fact, the graph shows that the majority of ties that bind individuals with a management vision to the environmentalist ones are limited to information exchanges, or to a conflicting

nature. The qualitative research shows that these exchanges are evidence of the insiders' domination on the outsiders. For example, the numerous consultations and hearings organized by the legislative committees cause much discontent among activists, since their proposals are not taken into account by legislators. With less chances to access the production of federal public policies, outsiders tend to adopt radical and less pragmatic discourses (Azuela, 2006). This is what is shown by the case of some of the activists of the Amecameca and la Compañía Rivers basin that gradually left aside the promotion of water management systems in a territory to get involved in a general opposition to the CNA. While "insiders" are concerned with water management to perpetuate the existing models, the "outsiders" seek to implement new management models that give them more prominence and generate "society awareness".

The network analysis also shows that individuals with a management speech, and pro-social environmentalism individuals are part of two different coalitions, each characterized by a specific type of relationship among its members. The two clusters that grouped pro-economic growth individuals are relatively well connected to each other. Cluster G3 brings together representatives from the private sector, directors of urban water operators and legislators, while Cluster G4 mainly corresponds to individuals who belong to federal bureaucratic institutions. Beyond this division, these individuals are linked together. This cohesion can be understood in large part because of its *insiders* position. These actors belong to bureaucratic institutions and political representation, have offices in Mexico City and are linked together in an official manner, as well as by a continuous exchange of information and regular meetings. The fact that most of the ties that bind insiders have been classified as "mandatory coordination" puts in evidence its strong institutionalization. The nature and the density of the ties that bind them allow us to affirm that the majority of people with a management speech are part of the same coalition. A classification based on indicators about the individuals' centralities in the network (In-degree, Betweenness Closeness, Eigenverctor and Clusterin coefficient) served to emphasize the four most important individuals. Two of these are part of the technical-administrative coalition: the CNA director and the chairman of the Deputies Chamber for Water Supply and Sanitation Committee (represented in the chart by the two larger circles within the technical-administrative coalition).

Despite having more homogeneous political positions than individuals with a management vision, pro-social environmentalist individuals are also divided into three clusters and the ties that bind them are relatively fragile. A first explanation of this is the relatively recent integration of pro-social environmentalist individuals in the federal water policies subsystem which is reflected in the low institutionalization of their interactions. This has an impact on their activities' practical conditions. The meetings organized by activists from different parts of the country are

much less common than formal meetings regularly attended by members of the technical-political coalition. The weakness of the official ties that unite organizations to which activists belong also explains that the ties binding them to the individual level have been classified as exchanges of information or "pure coalition", while the links of "mandatory coordination" are a minority. Paradoxically, one of the main encounter places between the elites activists are the many advisory committees (the Chamber of Deputies, the Senate or basin among others) organized by public authorities. These commissions strengthen ties within the activist coalition. Despite their fragility, the links that form activists between themselves aim to increase their chances of having an impact on the water public policy. Therefore, we can say that people with a pro-social environmentalism speech are part of the activist Coalition, identified by the qualitative observations. The classification based on indicators of stakeholders' centrality allowed us to note that two of the most important ones are part of the social environmentalism coalition. It is a couple of UAM researchers (represented on the chart by the two larger circles within the social environmentalism coalition) who, due to the weak activist coalition institutionalization, play a fundamental role of intermediaries.

Beyond antagonisms, the ambivalence of intermediaries in federal water policies

Beyond the confrontation between antagonist coalitions, ACF invites us to pay attention to the key role stakeholders who lead an intermediaries' position play in public policy processes. These intermediaries help to break with the dichotomous scheme between, on the one hand, a technical-administrative coalition and, on the other, a coalition for social environmentalism, thus demonstrating the subsystem complexity in federal water policies. Combining quantitative and qualitative methods shows how these intermediaries have contributed to reconfigure relations of power by providing resources to the social environmentalism coalition, without subverting the technical-administrative coalition's domination.

Two types of intermediaries were identified. The first ones are conciliation intermediaries who correspond to the intermediaries commonly conceptualized by ACF theorists: "While the majority of participants wants to influence public policy processes and their results within coalitions, the public policy intermediaries want to find reasonable compromises between the two coalitions (…). They generally have both coalitions confidence and have a certain authority in decision-making." (Weible & Sabatier, 2006). In the case of the federal water policies subsystem in Mexico, the fragmentation of the relational structure offers, in fact, opportunities for accumulation of power to individuals who seat on interface positions between the opposing coalitions. These conciliation intermediaries (represented by a circle

with a cross) occupy, in fact, a distinct position in the sociogram: their speech was classified as pro economic growth but belong to a cluster within which the rest of the individuals have a pro-social environmentalism speech. They accordingly have links that have been classified as "interested coordination" with members of the social environmentalism coalition. The qualitative research reveals that the discourses of these stakeholders are actually more heterogeneous than what the quantitative approach tends to say. Their common matrix is difficult to define for the fact that they do not openly take party for one of the two opposing coalitions. Consider, for example, that the participation of activists in the public policy processes can be positive, without having a negative view of the federal government action. Some promote a pacification of the discussion through dialogue, within the framework of a democratic water governance. These pragmatic discourses are mainly driven by academics, with important hierarchy positions within prestigious academic institutions in Mexico City, by certain federal legislators and by the leader of an influential private foundation. These actors can have, at the same time, a certain closeness to activists, politicians, and high-ranking officials of the bureaucracy. The case of conciliation intermediaries shows that shared beliefs are not the only ones in influencing the development of public policies; the political pressure exerted during conflicts, as well as the family ties that bind certain actors, can also have a strong influence. According to indicators of centrality, none of these intermediaries belong to most important stakeholders' category in the social network involved in the controversy surrounding the LGA. However, they are characterized by having links with important stakeholders, which shows their intermediaries position.

The first conciliation intermediary is a PRD member, grandson of a former secretary of hydraulic resources for the PRI. He has strong links with members of the water bureaucracy, with whom he shares a similar pro economic growth speech, but maintains, at the same time, a certain closeness to activists. He is, in addition, president of one of the two commissions in charge of water management in the Deputies Chamber during the debates on the LGA, an important official position in the Mexican water policy. On several occasions he has supported the alternative law project proposed by activists, before finally retracting and giving his support to the antagonist reform project driven by the federal water bureaucracy. His contradictory statements gave an unprecedented visibility to the activists' demands, destabilizing the "insiders" group cohesion.

The second is the director of a prestigious private philanthropic foundation, which has a specific program to support development projects in water management. This foundation funded a research conducted by academics with a central position in the activist coalition, which resulted in the publication of a participatory planning proposal and sustainable water management in a suburban area of Mexico City, besides the planning provided by CONAGUA (of Amemeca

Rivers Basin Commission and the Company 2011). This research has also served as a basis for the elaboration of alternative proposals to those of CONAGUA for the LGA reform. The financial resources made available by the Foundation served to consolidate the activist coalition, to improve their expertise and their ability to influence public policies through the urban planning and legal instruments production. The private foundation support is mainly due to the fact that the director is the brother of one of the activist coalition leaders. Both are members of an ancient lineage of aristocratic family, composed of many senior officials, politicians and intellectuals. The network analysis allows us, in this case, to emphasize the importance of social capital to gain resources, which could go unnoticed by an analysis only focused on the official institutions. The private foundation director does not share, however, the radicalism of the activist coalition speech, nor his brother's. The foundation directors' board is strongly linked with eminent members of the politico-administrative and economic elite of the country. The ambivalent position of the director is evidenced by an award delivery – during an official event in the presence of the CONAGUA director – recognizing his efficiency to water and sanitation public-private operator, whose management practices, strongly criticized by activists and reported as a result of the water privatization, are at the center of the Saltillo conflict.

Lastly, the third individual is the PRI municipal president who re-municipalized water management in a small town, on the outskirts of the Saltillo city, after a short period of public-private management. The re-municipalization was a promise that the then candidate decided to put at the center of its election campaign, because of the strong social mobilization against the private participation in water management, which broke after a cost increase without noticeable service improvements. This individual did not directly intervene in the LGA debate. The remunicipalisation was however, considered as a victory for the activist coalition, and served to strengthen the conviction that the "privatization of water" can be reversed under the pressure of a social movement. This intermediary actor is distinguished from the previous two by the fact that, despite his regular contacts with activists, he maintains a relationship of mutual distrust with them. Through the numerous protests at the local, national and international levels, activists created conditions for the PRI candidate to integrate the remunicipalisation in his campaign, in order to win the elections. This does not mean they consider him as an ally. However, inspite of his motivations and the state of his relationship with members of the activist coalition, he is in fact, as the two previous stakeholders, a conciliation intermediary within the studied subsystem.

Now, introducing a multilevel perspective between local conflicts and the national LGA controversy enabled the identification of other kinds of intermediaries, whose role is not explicitly conceptualized by ACF: intermediaries between different levels of water management within the same coalition. These actors are at the

interface between individuals belonging to institutions with formal and legal power to make decisions in the federal water policy area, and individuals outside these institutions. The qualitative observations allowed to establish that leaders of the social environmentalism coalition are multilevel intermediaries, a part of its political legitimacy rests on its ability to represent the coalition against federal authorities. Understanding its position requires an analysis retake of the social network studied.

The sociogram *(Cf. Figure 8.2, Sociogram of the relations between institutions, p. 428)* allows us to observe how coalitions are influenced by the integration of stakeholders who, in addition to being involved in discussions surrounding LGA, are equally involved in local conflicts. As expected, the individuals involved in the same local conflict share many links between themselves. However, there are differences in the position occupied by individuals within the social network depending on the local conflict which they are involved in. Members of the social environmentalism coalition involved in the Saltillo conflict are grouped in the upper right corner of the graph and are relatively isolated from other members of the social environmentalism coalition. The only individual with a pro-social environmentalism speech in the Saltillo conflict, well connected with other members within the same coalition, is a consultant in hydrology and environmental water management, who, however, does not have direct links with powerful politicians, nor with members of the opposite coalition. In contrast, the majority of the social environmentalism coalition members involved in the Chalco Lake conflict are located in the cluster, in the graph center, and share strong links between their inner circle but also have multiple relationships with activists who are not involved in the Chalco Lake conflict: researchers in their majority, but also Saltillo conflict activists, as well as two federal deputies of the Left. The differences in the positions held in social networks based on the belonging to a local conflict constitutes another impact over the federal water policies subsystem centralization. The concentration of institutions that hold the formal and legal power to make decisions in Mexico City creates inequalities between activists involved in a conflict located in the Mexico City peri-urban area, and activists involved in a conflict located at more than 800 kilometers from that city.

To live and work near Mexico City is certainly an advantage for activists who seek to influence federal policies. However, it is not enough to become multilevel intermediaries. To achieve this, they need the necessary resources in terms of expertise and, especially, of contacts within government institutions. The Pedro M. case illustrates this situation. This UAM researcher who holds a doctorate degree in planning and development from a British university, is the director of a research center on sustainable development, whose studies mainly focus on the outskirts of Mexico City. Descendant of the *novohispana* aristocracy, he is member of a family who has belonged to the political elite of the country for several generations, and several of his brothers hold important positions in universities, in national politics,

in the private sector and as powerful public officials. Pedro M. is one of the most important four individuals according to centrality indicators. He is in fact one of the main intermediaries between other activists visible in the graph (mainly academics, representatives of local NGO's and activists) and the two federal pro social environmentalism deputies who took part in the debates surrounding LGA.

Both deputies' profile, members of the social environmentalism coalition and belonging to Left parties (Morena and PRD) are symptomatic of the relative political openness of the Mexican system, initiated in the 1980s (Wilder, 2010; Kloster & Alba, 2007). We should not overestimate their influence in decision-making. They hold a position in the relational structure and distinct political positions related to the PRD deputy previously mentioned. They are neither part of the network core, nor of the social environmentalism coalition, as well as the intermediaries of conciliation discussed above. They are, however, characterized by having links with central stakeholders in the network, in this case, the UAM academics. Their speech in the Deputies Chamber is a minority, they do not belong to any of the two Deputies Chamber commissions specialized in water management and have almost no link with senior CONAGUA officials. However, thanks to them, the pro-social environmentalism speech could penetrate in this central place of power and give rise to a strong debate among its members during the legislative debate on the LGA reform. The observation of the relationships depicted in the graph helps us to understand one of the ways in which the activist coalition comes in contact with the dominant coalition, coming first from academics, later from federal pro-social environmentalism deputies, and a final confrontation with individuals with a management speech. Other members of the cluster located in the center of the graph, Mexico City academics, can take up a role of multilevel intermediaries similar to Pedro M.'s role, considering that they are regularly invited as water experts in forums organized in the capital, where representatives of the federal government also participate, as well as having the "outsiders" participation.

Conclusion: beyond the polarization of coalitions for water policy?

This study shows that the strong conflictive nature of the debates surrounding federal water policies in Mexico is, in part, the result of the partial implementation of public policy instruments, in particular of citizen participation mechanisms, as basin committees or citizen law initiatives. Activists close to social movements and universities consolidate the links they have in their inner circle, with the goal of appropriating these instruments. However, this appropriation leads them also to deal with the maintenance of a centralized and bureaucratic system in contradiction with the decentralization reforms and sustainable management provided by the

law. The appropriation of public policy instruments by rebellious actors outside the State bureaucracy, was favored by the World Water Forum organization, developed in 2006. This international event gave visibility to water management beyond the technocratic or local areas, also increasing its value as a political resource to be imposed in relations of force.

As a consequence, the tension between the multiplication of involved stakeholders and the maintenance of authoritarian water politics produces a strong polarization of the federal water policies subsystem. There are two antagonist coalitions: a technical-administrative coalition, primarily composed of senior officials and federal state politicians, and a social environmentalism coalition, mainly composed of academics and NGO leaders. The two sets of conflicting beliefs that characterize these coalitions excelled during the controversy surrounding LGA. The first is mainly characterized by its emphasis on the financing problems that affect the operation, maintenance, and extension of urban water services and hydraulic infrastructures. The second is characterized by its emphasis on the need to exit the water management model focused on the large hydraulic infrastructures and the involvement of the private sector, in favor of a more comprehensive model of natural cycles management, respectful of the environment and to social equilibrium. Each set of antagonist beliefs corresponds to preferences for certain public policy instruments, such as the full water services cost pricing for the first and the basin committees for the second. There are discourses that do not fit so sharp in any of these beliefs, but were not visible during the discussions surrounding LGA, highlighting the difficulties in finding compromises between the two coalitions.

The strong antagonism that characterized the subsystem confers importance to inter-coalition intermediaries, through which the pro-environmentalism coalition had an impact on water public policies. In fact, members of national or local political elites spoke in favor of the social environmentalism coalition or provided them with resources despite their distinct beliefs. The network analysis shows that these intermediaries considered they were forced to provide such support because of family ties or activists' public pressure. The activists' incidence on the federal policies remains, however, very limited, since it is primarily embodied in the defensive actions that stakeholders of the dominant coalition implement, in order not to lose its legitimacy by confining the dispute, and hence the power of the social environmentalism coalition. It is the case, for example, of the legislative discussions blockade about LGA, and the redistricting of water operators in the outskirts of Saltillo city, which, in spite of its strong symbolic dimension, does not lead to a radical modification of water policies, and even less to a concrete implementation of the activists' proposals at the federal level. The support provided by intermediaries who do not necessarily share the activist coalition's political positions, although crucial, reveals itself as fragile and ambivalent, since these tend to avoid any confrontation with federal authorities.

To complete the network analysis, the role of the intermediaries' intra-coalition, which establishes links between local activists and pro-social environmentalism coalition members, was also put in evidence. These multilevel intermediaries reproduced, however, a certain domination specific to the subsystem, from national to local, from Mexico City to the rest of the country, as well as from the academic elite to the social movements' representatives.

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Police controls a protest for water in Billings in Metropolitan Region of São Paulo.

WATER TRANSFERS AND INSTITUTIONAL STANDSTILL

Coalitions set in the access-to-water conflict in São Paulo

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Introduction: water scarcity and the struggles for the definition of public policy

This chapter presents an analysis about the decision-making process concerning the ways to face water scarcity in São Paulo Metropolitan Region (*Região Metropolitana de São Paulo* – RMSP), mainly when it comes to the transposition of water from the Billings Dam to the Alto Tietê System. This research was based on the analyses of network socio-economic structures and on the coalitions set from these networks depending on the identification of different values and on the perception of managers, technicians, and civil society entities involved in RMSP water management. Such a conflict was not just for ownership, but also for the definition of a more efficient and legitimate management method, mainly in terms of environmental justice due to the inequity in water access and to the environmental unsustainability in the ownership processes.

Southeastern Brazil faced a long drought period between 2013 and 2016 caused by the combination between atypical climatic events in summer and low rainfall indices (ANA, 2016), which did not allow reloading the main water supply reservoirs in RMSP. In addition, the scarcity of water for domestic supply got worse due to the bad and non-preventive water-resource management system. This severe water scarcity rang the bell for the fragility of environmental management models applied to face environmental challenges, mostly related to extreme events and to the impacts from climate changes, which tend to be more frequent in global, national and regional scale (IPCC, 2007). The predictions for extreme events such as intense drought and floods in Latin America and in the Caribbean area are questioned, since 35 million people do not have access to drinking water and approximately 100 million do not have access to sanitation sewage (ONU, 2014); such numbers worsen the access-to-water conflict.

Some structural and contingency measures were taken by the São Paulo State Basic Sanitation Company (*Companhia de Saneamento Básico do Estado de São Paulo* - SABESP) aiming at facing the hydric crisis and enabling public supply to

the population. These measures were an incentive to decrease citizens' consumption and to interconnect different supply reservoirs in the region. These interconnections were based on the relocation of investments supposed to be used in sewage treatment and in the protection of water springs for the conduction of emergency construction projects. One of the main construction projects was the transposition of four thousand m^3/s of water from the Billings Dam (an arm of Rio Grande River) to the Alto Tietê System (Taiaçupeba River). This measure was introduced as an alternative to avoid water supply rotation (SABESP, 2015).

However, water transference projects can lead to inequity in water access and tend to worsen the hydric injustice framework (Britto, 2015; Fracalanza & Freire, 2016). Consequently, it can end up in contingencies and inequity to population health itself, since – besides limiting the access to a safe amount of water – there are problems concerning the quality of the supplied water (Moraes & Jordão, 2002; Razzolini & Gunther, 2008; Tundisi & Tundisi, 2015). Accordingly, based on an ecological viewpoint, big construction projects, such as water transferring from one watershed to another, represent water-contamination risk and environmental impacts inherent to the transposition process.

Entities representing civil society suggested alternatives to minimize water scarcity impacts on population health and life when the region was going through the very core of the hydric crisis. Their propositions counter-posed the decisions based on strictly structural bias advocated by SABESP and by the State Government (Sanitation and Hydric Resources Bureau - *Secretaria de Saneamento e Recursos Hídricos* / SSRH) (Aliança pela água, 2015). Therefore, in August 2015, two public hearings were conducted by São Paulo State Public Prosecution Ministry to investigate many claims related to measures taken by SABESP and to control the quality of the water provided to the population.

Moreover, scholars pointed out that it was an "announced crisis", since the lack of natural resources for population supply was for long known and outspread (ANA, 2005, 2007, 2014; Whately & Cunha, 2007). Consequently, the need of planning new public supply options for RMSP was known; these plans would be able to diminish the Cantareira System dependence, which was responsible for approximately 60% of the State urban population in 2014 (Ribeiro, 2011; Leão & Castro, 2015). Marengo et al. (2015) pointed out that the Brazilian Southeastern Region had faced intense seasonal droughts in 1953, 1971 and 2001; however, in the summers of 2013-2014 and 2014-2015, RMSP faced one of the worst droughts of its history. According to these authors, the combination of low rainfall indices throughout the aforementioned periods, the great increase in water demand, the lack of proper hydric resource management, and the low consumers' collective awareness about rational water use, led to the "hydric crisis" framework.

Briefly, the hydric crisis period was marked by uncertainty, lack of transparency and by contradictory information (Dias, 2016). Some regions in São Paulo County

were forced to depend on tanker-trucks (Marengo et al., 2015), a fact that affected the population in an unequal way. As usually shown by surveys based on the notion of 'environmental injustice', people living in poor neighborhoods suffer a lot more with lack of water than populations living in "better" neighborhoods (Leão & Castro, 2015). Consequently, the assumptions addressed by the hydric resources management in Brazil set that issues associated with water must be mostly solved through political and social negotiation processes, which involve distinct levels of government and social actors (Fracalanza et al., 2009). Nevertheless, in order to make such proposition real, it was worth overcoming the limits of the negotiation process due to the articulation deficit between hydric resources management instances and municipal governments, as well as between the communication and participation of different actors.

Based on the exposed panorama, the research hypothesis lies on the assumption that decisions were made by a small group of high level institutional position which had access to economic and politician resources (named the dominant coalition) to perform their proposal. Due to that, the decision-making process was centralized and based on strictly technical arguments, with low transparency and the exclusion of civil society actors and of the deliberative and participative instances planned in the hydric resources management model applied to São Paulo Metropolitan Region.

The Billings Dam and the complexity of water supply in the São Paulo Metropolitan Region

The São Paulo Metropolitan Region (RMSP) covers 39 counties, some of them being important industrial centers, as well as a population of approximately 22 million inhabitants. Of those, approximately 12 million live in the capital, São Paulo City (IBGE, 2015), within an area of 7,946 km² (SEADE, 2014), which is almost completely inserted in Alto Tietê Watershed (SIGRH, 2017). The water public supply in São Paulo County is performed by São Paulo State Basic Sanitation Company (*Companhia de Saneamento Básico do Estado de São Paulo* - SABESP), which is a public mixed capital company – 24% of its stocks are in the New York Stock Exchange; 25.7%, in BM-Bovespa; and 50.3% of its stocks belong to São Paulo State Government. SABESP is also responsible for sewage collection and treatment in São Paulo County since 1973 (GEO Cidade de São Paulo, 2004).

The RMSP counts on eight supply systems, among which four supply São Paulo City: Cantareira System, districts in the Northern and Central zones, part of the Eastern and Western zones, and ten more counties in the RMSP region. Guarapiranga/Billings System supplies the entire Southern and Southeastern

zones; Alto Tietê System, to part of the Eastern zone; and Rio Claro System, to the Sapopemba region. Among these systems, only Guarapiranga is completely located within the limits of São Paulo County (GEO Cidade de São Paulo, 2004).

The Billings Dam is the biggest water reservoir in RMSP: its water surface has 108,14 km^2 and covers six counties[1]. Nowadays, the quality of the water in Billings Dam is quite bad due to the reversion of the Pinheiros River flow (through water pumping) to the reservoir in order to broaden the power generation in Henry Borden Plant in the São Paulo coast. However, since 1922, such pumping process is only allowed to be put in practice in emergency situations, when there is risk of floods caused by intense rainfall in RMSP (Fracalanza, 2002). Moreover, the intense occupation of the dam's sides by irregular housing without basic sanitation led to eutrophication in many regions of it. Because of the severe pollution framework, some Billings Dam regions were isolated by government interventions to preserve the quality of the water in the less polluted arms. It was the case of the Rio Grande System, which was isolated from the Central Body in 1982 as a way to preserve it for domestic supply in Grande ABC[2] region (Capobianco & Whately, 2002).

SABESP started the construction project of water transposition from Billings Dam (Rio Grande Arm) to Alto Tietê (Taiaçupeba Arm) during the hydric crisis as one of the solutions predicted to minimize the crisis effects on RMSP public supply. The financial cost of the construction project was approximately 42 Million U$. Part of the payment was made with SABESP's resources, and the other part was made through the reallocation of resources from the Mananciais Program[3], which is funded by the World Bank. This bank authorized using the funds because the Program was inactive; therefore, the conduction of the water-transposition construction project was favored by the urge to assure water supply. The transposition was done within a 22 km line, although just part of it (13 km) was used for the installation of underground and surface pipelines. These last ones were placed on lands where there were Petrobrás gas pipelines, and it was done after negotiations with landowners.

Accordingly, actors in the coalition identified as dominant followed all the necessary procedures for the water-transposition to be conducted as an emergency

1 São Bernardo do Campo, São Paulo, Santo André, Ribeirão Pires, Rio Grande da Serra and Diadema. Billings reservoir comprises eight arms (or sub-regions): Rio Grande, Rio Pequeno, Rio Capivari, Rio Pedra Branca, Taquacetuba, Bororé, Cocaia, and Alvarenga.

2 The Grande ABC region is characterized as an industrial São Paulo zone, it comprises the following counties: Santo André, São Bernardo do Campo, São Caetano do Sul, Diadema, Mauá, Ribeirão Pires, Rio Grande da Serra.

3 The Water Springs Recovery Program (*Programa de Recuperação dos Mananciais* - PRM) is a set of actions focused on urban development, on environmental protection and on social improvement; it was based on intervention areas in Billing's Guarapiranga, Alto Tietê-Cabeceiras, Juqueri-Cantareira, and Alto and Baixo Cotia sub-basins. The PRM was elaborated in 1990 by the State Government.

project within a short period of time. In January 2015, São Paulo State governor, Geraldo Alckmin, outspread the proposition to transpose Billings Dam water to Rio Grande arm. The construction site was opened in May and the project was ready to operate at the end of September 2015, when it was launched.

In opposition to such centralized decision-making process, many critics to the transposition of the water from Billings Dam to Alto Tietê System emerged; these critics stated that this decision was centralized on SABESP's hands, as well as on the hands of the São Paulo State governor. The State Prosecution Ministry and organized civil society groups questioned the company about the quality of the water provided to the population; about the environmental licensing conducted in a simplified framework; and about the floods in ABC region when the site was launched. In fact, the construction site was stopped by Ribeirão Dias City Hall few days after it was launched due to landslides and floods caused by water pumping (Leite, 2015).

Research Methodology and Conceptual Range

The current study identified the actors involved in RMSP water management based on the ACF approach *(Cf. supra Introduction; p. 12-57)*; it highlighted how decision-makers articulate themselves in the highest institutional and governmental positions. In order to do so, semi-structured interviews were conducted, as well as the search for news reports spread in local and regional papers and magazines. The choice was made to interview actors from Alto Tietê Watershed Committee (*Comitê de Bacia Hidrográfica do Alto Tietê*) and actors mentioned in the news reports. After the first interviewees were chosen, the snowball sampling method, which is an instrument consisting in asking these interviewees to recommend companions qualified to participate in the interviews to create a chain of reference, was applied (Strauss & Corbin, 1998). This approach is important when the nature of the subject makes it difficult to get clear opinions; besides, it contributes to understanding the bond between interviewee and the actors nominated by him/her (Heckathorn, 2002). Thus, it was possible increasing the number of participants and identifying protagonists showing stronger influence (the most recommended actors by the interviewees). The listing of interviewees stopped when the same names started to come out again.

The network was modelled based on the collected data. On the one hand, the network analyses allowed determining the position of each actor in the graph by calculating its relational attributes (centralities, importance, brokerage roles, etc.) and, on the other hand, limiting different cohesive groups each actor belongs to, including communities. These are classes resulting from a network partition, so that the density of intra-class links is as high as possible, and the density of interclass

links as low as possible. Thus, the network analyses make it possible to construct the relational profile components of each actor. At the same time, a series of typological analyses applied to actors, and performed according to the Hybrid Clustering method, was carried out to assess different representation themes, such as the perceptions about the conflict, political preferences, degree of political influence, and values identified in the exploratory research. Next, an ultimate coalition-identification phase was set through typology synthesis by combining the previously mentioned thematic representation of actors, their relational profiles and personal attributes/resources (type of organization they belong to, territorial attachment, educational and professional background, type and level of associative and activism implications, political position, influence and decision-making capacity, etc.).

Moreover, the relations between individuals were defined according to a typology of links defined by the Bluegrass Project and inspired by Weible (2005). The nature of the link composes a web of opposite, collaborative or hierarchic relations synthesizing a network of coalitions *(Cf. Supra Introduction; p. 12-57)*. Accordingly, the study suggested a typology of links divided in six categories, which were identified in the sociograms by the arrows: (1) information exchange, (2) mandatory coordination, (3) hierarchical coordination, (4) interested coordination, (5) pure coalition, and (6) conflict. The most relevant contribution from the approach was the visibility given to the social actors excluded from the decision-making process. These actors belong to less influential spheres of public policies, as well as represent the part of civil society that does not have access to the decision-making arenas. The exploratory research enabled observing the different personal and professional trajectories helping the construction of individual beliefs and values. However, at the same time, the emphasis given to individual values emerged as a limitation of the approach to the understanding of some actors' ambivalent action. An example of it is the actor who shares the same perceptions in his/her discourse about a certain topic, although the situation, or the medium he/she is inserted in limits his/her actions and positions due to institutional embarrassment. According to North (1990), there are the "rules of the game" in society, or human embarrassments, that shape human interaction. It can enable to overcome barriers that impair the collective action and/or that result in rooted traditions deriving from inefficient decisions.

Such view brings back the State, since it conceptualizes *actors* and *structures*. In the *actors'* position, bureaucrats and politicians act according to their interest in developing their careers and to their sense of "good" government. In the *structure's* position, the State – represented by its organizations – draws the policy formulation process and, therefore, the access of many social groups and strata to the governmental decision-making process, as well as the ways to implement the policies (Rodrigues, 2011). Litcherman & Esparza (2014) call the attention to the fact that the institution plays an important role in the creation of opportunities

and restrictions to the action of individuals inserted in the institutional culture who reproduce rules, attitudes and behaviors.

Coalitions in the conflict caused by water distribution during the hydric crisis in RMSP

The institutional structure expected for water supply management in RMSP

Since the 1990s, Brazil has adopted the systemic participative integration model, which was pioneer in São Paulo from State Law n. 7.663 from December 1991. In 1997, it was set at national scope by Federal Law n. 9.433 from January 1997, which established the National Hydric Resources Policy. The Federal Law acknowledges water as an asset of public domain, as a limited resource added with economic value, whose priority use in scarcity situation lies on human and animal consumption. Its main goals are to assure the necessary availability and quality of water to the current and next generations, the rational and integrated use of hydric resources and the prevention and defense against critical hydrological events of natural origin or resulting from the inappropriate use of natural resources (Federal Law nº 9.433/97, art. 1st).

The National Hydric Resources Policy (*Política Nacional de Recursos Hídricos* - PNRH) created the National Hydric Resources Management System (*Sistema Nacional de Gerenciamento de Recursos Hídricos* - SNGRH), which regulated subsection XIX of article 21 of the Federal Constitution. This subsection lists the principles of participation, decentralization and integration. The SNGRH is formed by the National Hydric Resources Council, the States and Federal District Hydric Resources Councils, the Watershed Committees, organs of the public federal, state, and municipal powers - whose competences are related to hydric resources management –, and the Water Agencies *(Cf. Annex 2: Water Policy and Technical Systems in Brazil; p. 40-49)*. The creation of these decision-making collegiate organs (national and state hydric resources councils and watershed committees), which are composed of representatives from the public sector, public and private users, and the organized civil society, was focused on the participation on decision-making processes concerning certain watersheds (Abers et al., 2010). The change did not represent a "new and heavy administrative structure, but, actually, it still demands a quite strong effort to articulate the existing institutions" (Porto & Porto, 2008: 48).

However, in opposition to the new hydric resources management model adopted in RMSP, the State government still prevails in decision-making processes (Souza, 2015). It happens either because decisions tend to be made in the governor's

office, along with São Paulo State Sanitation and Hydric Resource Bureau and the Environmental Bureau or, subsequently, because – as a formalization measure –, decisions are taken to the Committees in which the public power has privileged position due to easier articulations. When it came to decision-making about water transposition from the Billing reservoir to Alto Tietê System, it was possible noticing the decisions' centrality on the hands of a small group directly linked to the State Government and to SABESP. The Alto Tietê Watershed Committee was informed about the measures taken by SABESP to face the crisis, without any previous discussion about the demands of the watershed – collegiate approval. The relation between actors and coalitions will be assessed in the following item.

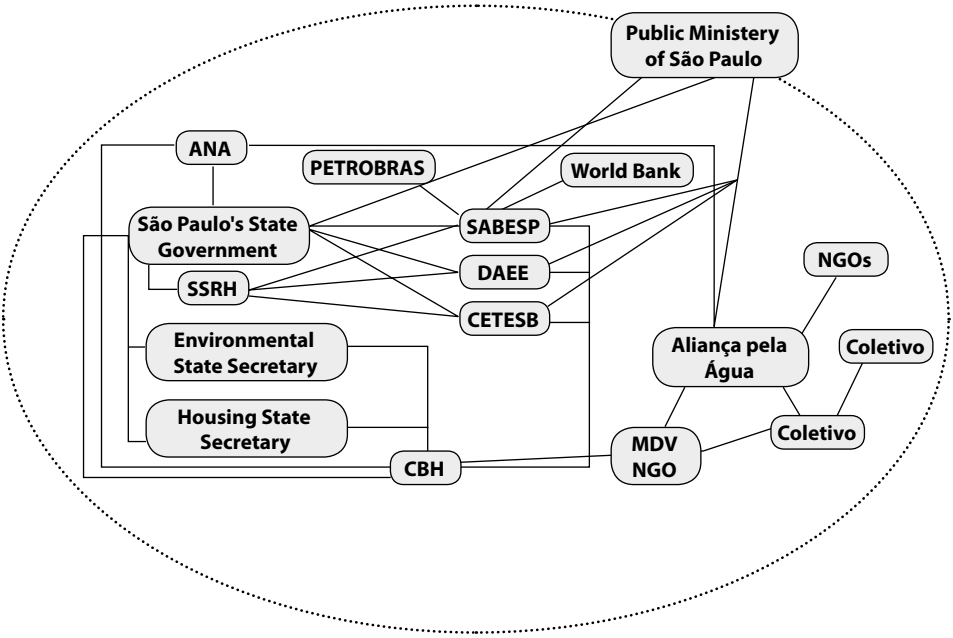
Institutions and individuals involved in the transposition from Billings Dam to Alto Tietê System

The study found institutions involved in water management in RMSP at institutional structure scope during the hydric crisis, mainly implicated in the water transposition from the Billings Dam. Figure 9.1 *(p. 279)* shows the multi-level aspect of water governance and of the hydric crisis in the region, based on the involvement of social actors and governmental agents from different local, municipal, state actions, and of actions in watersheds, according to the description of the studied conflict. However, it is worth highlighting that not all aforementioned institutions had some of their individuals interviewed in the current study. Some actors did not want to be interviewed, as well as some others were not interviewed because of time limitations concerning project conduction and researcher availability.

The multi-level governance clarifies how regulations and laws are set at regional and national level; however, somehow, the principles regulating them are influenced by international discussions that, on the other hand, are also not appropriate in its crude form, but covered by the local structure itself. Accordingly, some authors point towards the development of an international expertise measured by funding agencies (Massardier et al., 2016; Mollinga, 2008), such as the World Bank for the use of resources from a project of water springs environmental protection to conduct the transposition project at Billings Dam. In total, twenty-five social actors and governmental agents were interviewed among public managers, São Paulo State Sanitation Company technicians, CBH-AT members, and Non-Governmental Organizations. All the participants have offices in the current hydric resources policy or have acted before in the water management in RMSP *(Table 1, p. 280)*.

The interviewees are part of the sub-system related to the water transposition from the Billings Dam to Alto Tietê. Among these actors, one finds the Water Springs Program, which was developed by the São Paulo State Hydric Resources

Figure 9.1. List of institutions involved in hydric resources management during the hydric crisis in RMSP



Source: Exploratory research. Prepared by the authors

Sanitation Bureau; the Plan called CHESS[4], developed by SABESP to face the hydric crisis in RMSP; the São Paulo State Hydric Resources State Policies; besides Alto Tietê Watershed Committee, which is the arena opened to discuss hydric resources management in RMSP, where these different instances can be represented.

Actors linked to social movements and NGOs were also interviewed. Some of these institutions were the Alliance for Water, which has been working to articulate with other groups, NGOs, and civil society since 2014 in order to face the hydric crisis; the Fight for Water Group, which emerged during the crisis to suggest alternatives to solve the water crisis in São Paulo; the Democracy and Sustainability Institute (*Instituto Democracia e Sustentabilidade* - IDS), which is a think tank launched in 2009 to discuss topics cross-sectioning democracy and sustainability; the Life Defense Movement (*Movimento em Defesa da Vida* - MDV), which has been in place since 2011 to protect Billings water springs; the "Water Yes,

4 Hydric Crisis, Strategy and Solutions of SABESP for São Paulo Metropolitan Region launched in April 30th, 2015. Available at http://site.sabesp.com.br/site/uploads/file/crisehidrica/chess_crise_hidrica.pdf.

Profit No" Group (*Movimento Social* Água *Sim, Lucro não*), which fights for water and the environment - it groups workers from water distribution and sanitation, and from popular movements since 2015.

Table 1 - List of interviewees due to institutional identification according to the coding used in the research
Source: Field Surveys. Prepared by the authors

Code	Name	Institution
1	IDS	ONG Instituto Democracia e Sustentabilidade (Democracy and Sustainability Institute – NOG)
2	MPE-SP	Ministério Público do Estado de São Paulo (São Paulo State Prosecution Ministry)
3	Coletivo de Luta pela água / Universidade	Entidades e movimentos sociais / Universidade (Social Entities and Movements / University)
4	CBH-AT	Comitê de bacia Hidrográfica Alto Tietê (Estado) (Alto Tietê Watershed Committee - State)
5	MDV	ONG Movimento em Defesa da Vida (Life Defense Movement – NGO)
6	Aliança pela água (Alliance for Water)	Entidades e movimentos sociais (Social Entities and Movements)
7	Aliança pela água (Alliance for Water)	Entidades e movimentos sociais (Social Entities and Movements)
8	CETESB	Companhia Ambiental do Estado de São Paulo - cargo de alto nível (São Paulo State Environmental Company – High-Level Position)
9	CETESB	Companhia Ambiental do Estado de São Paulo - cargo técnico (São Paulo State Environmental Company - Technician Position)
10	Águas Claras Rios Pinheiros (Pinheiros River Clear Water)	ONG (NGO)
11	Ex-CBHAT / University	Comitê de Bacias Hidrográficas do Alto Tietê (Ex-membro - sociedade civil /Universidade) (Alto Tietê Watershed Committee – former member / civil society / University)
12	Sec. Meio Ambiente (Environment Bureau)	Secretaria Estadual de Meio Ambiente - cargo técnico (State Environment Bureau – Technician)
13	Coletivo água sim, lucro não (Water yes, profit no group)	Entidades e movimentos sociais (Social entities and movements)
14	CBH-AT /Coletivo de Luta pela Água (Fight for Water Group)	Comitê de bacia hidrográfica Alto Tietê - sociedade civil /Entidades e movimentos sociais (Alto Tietê Watershed Committee – civil society / entities and social movements)
15	Ex-CBHAT	Comitê de Bacias Hidrográficas do Alto Tietê (Ex-membro - sociedade civil) (Alto Tietê Watershed Committee / former member – civil society)
16	SABESP and University	Companhia de Saneamento Básico do Estado de São Paulo e USP - cargo alto nível / Universidade (São Paulo State Basic Sanitation Company and USP – high-level position / University)

Code	Name	Institution
17	SABESP and CBHAT	Companhia de Saneamento Básico do Estado de São Paulo - cargo técnico / Comitê de Bacias Hidrográficas do Alto Tietê - Representante da ABES (São Paulo State Basic Sanitation Company Technician / Alto Tietê Watershed Committee – ABES representative)
18	SABESP	Companhia de Saneamento Básico do Estado de São Paulo - cargo alto nível (São Paulo State basic Sanitation Company – High-level position)
19	SABESP-	Companhia de Saneamento Básico do Estado de São Paulo - cargo alto nível (São Paulo State Basic sanitation Company – High-level position)
20	SSRH / SABESP	Secretaria de Saneamento e Recursos Hídricos do Estado de São Paulo - cargo alto nível (São Paulo Sanitation and State Hydric Resources Bureau – High-level position)
21	SSRH	Secretaria de Saneamento e Recursos Hídricos do Estado de São Paulo - cargo alto nível (São Paulo Sanitation and State Hydric Resources Bureau – High-level position)
22	SABESP	Companhia de Saneamento Básico do Estado de São Paulo - cargo alto nível (São Paulo State Basic Sanitation Company - High-level position)
23	SABESP / ABES	Companhia de Saneamento Básico do Estado de São Paulo - cargo técnico - Comitê de bacia hidrográfica Alto Tietê - sociedade civil (Associação Brasileira de Engenharia Sanitária e Ambiental) (São Paulo State Basic Sanitation Company – High-level position – Alto Tietê watershed Committee – civil society / Brazilian Sanitation and Environmental Engineering Association)
24	EMAE	Empresa Metropolitana de Águas e Energia - cargo técnico (Metropolitan Water and Power Company – Technician)
25	SHE- Secretaria de Habitação Estadual (State Housing Bureau)	Secretaria de Habitação Estadual - Gerente de Planejamento Estratégico e Programas da CDHU- Companhia de Desenvolvimento Habitacional e Urbano do Estado de São Paulo (State Housing Bureau – Strategic Planning management and CDHU Program – São Paulo State Housing and Urban Development Company

Characterizing the networks and the coalitions

The metrics of the relational graph indicate low density (density = 0.042) and a very modular network partitioned into eight communities. Additionally, three coalitions were identified: the *ecosocial* coalition (orange dashed line), the *political-technocrat* coalition (pink dashed line), and the *pro-environmental institutional* coalition (blue dashed line) (*Cf. Figure 9.2, Sociogram of the political coalitions related to hydric resources management during the water supply crisis in RMSP, p. 429)*. The sociogram illustrates strong opposition between the first two coalitions. The liaison roles of certain actors from the third coalition may prove to be indispensable to the communication between these two first opposing coalitions.

Two members from the *pro-environmental institutional* coalition are particularly concerned with their liaison role: one from the Environment Bureau

(nº 12) and another from CBHAT (nº 4). These two actors also play important brokerage roles within their own coalitions, either as coordinators, representatives or gatekeepers. The field research showed that actors 4 and 12 have a pure coalition relationship (black arrow); this happens because they worked together before in order to formulate São Paulo State public policies. Accordingly, they are capable of gathering information and sharing values in different discussion spaces, a fact that allows information to flow between coalitions that have less direct influence on the decision-making process and those that have stronger influence over it. The stronger coalitions are represented by actors from high governmental institutional levels and from SABESP. However, it is worth pinpointing that actors 4 and 12 work in government organs; they are able to fulfil trust functions because they are subordinated to institutional rules and to the party of the government in office. Therefore, these actors take indirect actions in the decision-making process. Regarding Billings water transposition, actors 4 and 12 did not work together (they belong to two different communities) because of the decision made by high governmental and institutional level agents who compose the *political-technocrat* coalition. In any case, both introduced themselves as important people in water governance in RMSP; they were also mentioned by other interviewees as key-actors in the hydric resources public policy discussion in the region.

Network analysts found that, besides the sheer number of relations, the kind of relation also matters. Thus, the most important aspect is the relation between the person's contacts because one person who relates to other people who are not directly connected can have an opportunity to mediate them and get some profits of this mediation (De Nooy, Mrvar & Batagelj, 2012). However, the most important actor playing the liaison role belongs to SABESP (n°18) who is part of the *political-technocrat* coalition. This person controls most indirect exchanges between the two other coalitions. This actor also plays important brokerage roles, either within his own coalition (coordinator, representative, gatekeeper) or in an external one (itinerant broker). Actor 18 was the key element for the transposition project construction site, since he has a strategic and high-level position at SABESP. Therefore, he was responsible for coordinating information and resources exchange with individuals from other public institutions. He was also, for instance, in charge of articulating with Petrobras and with landowners[5] of the areas where the pipelines were set on. He also articulated with other individuals in the same group and coalition in order to get resources from SSRH Water Springs Program to fund[6] the

5 During an interview, there was report saying that the pipelines for the transposition site were placed on the same land where Petrobras gas pipelines were on (in a construction site area); therefore, landowners had to authorize the construction site in their properties. In order to have it done, landowners authorized the site after receiving a financial compensation.

6 There was a meeting in the U.S.A. with SSRH and WB representatives to issue the authorization to use the resource to the transposition construction project.

construction project. Moreover, this actor articulated with private institutions to purchase the necessary material to conduct the construction, which had emergency status; therefore, the purchase was done without the need of bidding.

Actor 18 also participated in the discussion arenas in CBH-AT; he represented the *political-technocrat* coalition. The solutions presented in the CHESS Report were only informed to CBH-AT due to the emergency status of the construction project; consequently, this organ requested better explanations to the State Sanitation Company, because the construction conducted in the Watershed needed to be approved during the assemblies, according to the existing legislation. However, the decision had been already approved by other instances, and Actor 18 represented SABESP and presented the decisions to the collegiate. Therefore, he played the role of gatekeeper, since he was the connection with different segments and had access to different information levels; he could control the information exchange between groups.

The most important role as itinerant broker was also played by an actor from the *political-technocrat* coalition. He was a SABESP member (Actor 19) through whom transited indirect relations within the *ecosocial* coalition or within the *pro-environmental institutional* coalition. He can indeed be considered as an itinerant broker, since he entered the hydric crisis scenario after the 2014 governmental election, time when he played the role of brokerage consultant in a high-level position due to his expertise and hydric resources background. He was capable of articulating with individuals in the same institution to get the expected solutions for the hydric crisis. It is possible noticing the different relationship Actor 19 had with other individuals in the same coalition, in the sociogram; he mediated information and resources between São Paulo State governor and a SSRH representative who, otherwise, would not be connected. Accordingly, he is connected with actors 18 and 16 through a mandatory coordination; it means that they have high or medium institutional connection, without the need to pursue the same core values; however, they need to work on common goals. The background and position of Actor 18 put him in the mainstream; which is the reason why he was mentioned many times by the interviewees and attended many events and media interviews. However, as shown in the sociogram, his relations can be for opposition (red arrows) or for information exchange (grey arrows).

This configuration of actors in the dominant coalition, such as the key-actors who circulate in discussion institutions and arenas, are important for the performance and legitimation of the decision-making process. It limits the coalition for few actors who soon articulate all the necessary resources to implement their proposition: the transposition project. Therefore, it is not necessary articulating with other coalitions, since the *political-technocrat* one controls the most influential resources for the decision-making process *(Cf. Figure 9.3, Influence and decision-making in addition to the kind of expertise shared within the three coalitions, p. 430)*.

The moment of deep hydric stress in RMSP was a window of opportunities for the actor in the dominant political-technocrat coalition to articulate the resources

to implement the construction site as a solution. This solution is based on the expertise and technical knowledge and on political and economic influence, since it comprises individuals in high-level positions trained in different engineering fields and on hydric resources management. The combination between public and private actors (from the same corporation) allowed the political-technocrat coalition to have the economic and political resources to make the project real, thus evidencing a centralized management and also a structural hole in the network, because it did not need to share the resources with other coalitions.

Accordingly, on the other hand, the *ecosocial* coalition has a broad expertise profile, although with only social decision-making influence resources. It explains this coalition capacity to get a larger number of actors and institutions as members; nevertheless, its resource was not enough to influence the decision made about the transposition project at Billings Dam, but it was against the technocrat management model adopted by the dominant coalition.

The actor who holds the maximum number of brokerage roles is a member of the Alliance for Water Association (n°7) in the ecosocial coalition (also in the entire network). Along with Actor 6, he is the main coordinator, but also representative and gatekeeper. Actor 7 played a relevant role in the movements opposed to the political-technocrat coalition, he acted many times as representative, since he was directly and indirectly related to almost all actors in the network and represented his community. This individual has the capacity to control in-bound information and resource due to the access he has to more information and resources; moreover, he has the power to make decisions if actors non-connected to the group have, or not, access to these information/resources (gatekeeper) (De Nooy, Mrvar & Batagelj, 2005). Therefore, because of the mediation of its social relations and professional background, Actor 7 was an important information and resources gatherer to mobilize some civil society entities and citizens to find strictly technical solutions focused on great engineering construction projects. Figure 9.2 shows these relations: when the Alliance for Water is represented by Actor 7, they are bond to other NGOs focused on environment conservation and protection. At that moment, given the high or medium political link, these institutions form a hierarchical coordination, which is linked to the fact that Actor 7 worked to and was member of these NGOs.

The coordination bond is shared with Actor 6 to form a pure coalition, since they are individuals who share the same beliefs and values, and who do not have institutional connection, but who had worked together in the past. Actor 6 played an important role in the development of the network, he outspread information within the coalition and articulated with different members, such as the pure coalition relation to actors 1 and 14, who, in their turn, will reach other groups and movements that discuss social aspects associated with water management in RMSP.

Besides the Alliance for Water, other civil society entities were involved in discussions to find short and long-term solutions to the hydric crisis, such as the

Fight for Water Group, the State Water Assembly, the Life Defense Movement, and the "Water Yes, Profit No" Group. It assures the broadening of expertise shared by these entities, such as the technical knowledge shared between engineering and management (the value shared in the coalition will be explained below) in association with the knowledge about the legislation and the socio-environmental aspects (Figure 9.3). These entities presented propositions concerning hydric safety in RMSP, such as the construction of rain water capturing wells in the short-term, the recovery of water springs and medium-term sanitation. However, these propositions did not stand out in the arenas where these members participated in. Such fact must be linked to these entities outstanding influence on the social aspect, which aimed at guiding and engaging civil society as a whole.

The claims arose by these entities, in addition to reports about the quality of the water in some São Paulo City regions, made the São Paulo State Prosecution Ministry conduct a public hearing to hear the population, as well as SABESP, ANA, DAEE and CETESB representatives. However, SABESP did not show up and the public hearing evidenced the large number of claims regarding the low quality of the water. Such result forced the Prosecution to issue a civil action[7] addressing the quality of the water provided to the population.

The Prosecution Ministry questioned the emergency in which the environmental licensing was issued, and it opened an investigation on the licensing process and on the Simple Environmental Impact Evaluation (*Avaliação de Impacto Ambiental Simples* - AIS). The AIS was performed by SABESP and approved by São Paulo State Environmental Company (*Companhia Ambiental do Estado de São Paulo* - CETESB) in order to authorize the water transposition construction site at Billings reservoir. Nevertheless, at that time, the existing uncertainty about the effective contribution of the project to the improvement of water distribution in Alto Tietê Production System remained, because of the severe environmental impacts that could come from it.

The Prosecution Ministry played a very important role during the hydric crisis, it intermediated the population demands, the ecosocial coalition and the pro-environmental institution in issues related to the decisions made by the political-technocrat coalition. According to Sabatier (1993), an actor who intermediates conflicts between coalitions can be considered as a policy broker. Therefore, Actor 2 (Prosecution Ministry) is a policy broker due to his role of intermediating parts in order to find a balanced solution to the water supply issue, based on the water management and supply conditions regulated by the legislation.

7 Public Action issued by São Paulo State Prosecution Ministry, because of the act of administrative improbity performed by the Group of Special Defense Action Towards the Environment – River Mouth Center and Public Patrimony and Social Capital Prosecution. Available online at: http://www.mpsp.mp.br/portal/page/portal/comunicacao/Newsletter/imagens_newsletter/ACP%20Transposi%C3%A7%C3%A3oBillings.pdf.

Core values and professional trajectory

Coalitions are formed from existing relations between individuals and institutions, and also from shared values between coalitions, so that their goals are accomplished. Accordingly, shared values are the core values gathering a certain group of individuals. The deep core is composed of the most fundamental and guiding values of its actions (Sabatier & Jenkins-Smith, 1993). These core values are based on two aspects: the *policy principles*, by taking into account that general principles must be the priority in water public policies (Figure 9.4a) and; the *policy content*, which must be substantially taken into account (Figure 9.4b) *(Cf. Figures 9.4a & 9.4b, Political principles and priorities (a) and political content (b) taken into account to formulate the core values groups, p. 431).*

Figures 9.4a and 9.4b depict that individuals share political priority values in the political-technocrat coalition such as the "privatization of sanitation services", "total recovery of financial investments" and "greater mobilization for water use". This last priority is associated with engineering projects based on models focused on better water supply, which are represented by the blue nodes in the sociogram (Figure 9.2); they compose the *technical-corporativist* core values. The core values are influenced by the individual's professional and personal trajectory in life, which makes him/her have certain preferences and actions. When it comes to the political-technocrat coalition, six actors are important, because they have a pure coalition link: five of them (actors 21, 19, 16, 22 and 18) work with civil engineering and are specialists in hydraulics, hydrology and in hydric resources. Most actors are directly, or indirectly, linked to SABESP, besides to the State governor, and have history in acting in management positions such as secretaries and presidents of institutions and organs responsible for conducting water management policies and programs at regional and national level. This *technical-corporativist* composition shows the strong influence of technical and political expertise as the main resource shared between actors. It also enables the combination of ideas and information within a restricted group, in which executers, managers, administrators, and technicians work together to achieve the propositions set to the hydric crisis.

The second coalition, the so-called ecosocial, shares political priorities concerning health protection, environmental protection and water as a common asset, as well as more stringent rules for large users and heavy polluters, greater participation of social organizations and watershed committees (Figure 9.4), composing the *socio-environmentalist* core values (green nodes in the sociogram). These core values can be justified by many of the actors' professional trajectory. Most actors in this coalition have already acted in NGOs, and in social and collegiate movements, besides having access to different knowledge fields, such as social, human and biological sciences. Accordingly, the influence capacity of the ecosocial coalition is strong on pair communities, participative management and on

society advocacy. It goes against a centralized decision-making process. The coalition got to expose the issue and to broaden the opposition network to the dominant coalition as an attempt to access information, as well as political-economic resources to influence the decisions made.

Based on the herein analyzed relations, the pro-environmental institutional coalition is the one that has some actors who work as a bridge between the other coalitions, but they do not have explicitly defined core values. They are also the connection with individuals with socio-environmentalist core values and to other individuals seen as generic (grey nodes). The group highlighted as of *technical* values presented vague opinions, without clear positioning about the necessary political priorities and contents. Those individuals just pointed out two options as being relevant, namely: environmental protection and more stringent rules for large users and heavy polluters. It is worth highlighting that only three public servers shared these core values and that they were little mentioned in the research; they are public servers who have low-level or technical positions. The pro-environmental institutional coalition also has actors from different knowledge fields; however, their institutional bond is almost total with the State and County. These actors are relevant for the conflict, but they are not actors who have influenced the decision about conducting the current study. Thus, they had no link of pure coalition type towards the dominant coalition. Moreover, they also do not have conflict relations with all the other coalitions, thus indicating that they are consumers between coalitions.

Conclusion: engineering management against citizens' organizations

The case study presented a clear dispute between hydric resource management programs. One group was based on engineering-based management model, excluding the participation of different users and civil society; it was focused on performing big construction projects to broaden water offer in RMSP. The other group was based on short-, medium- and long-term solutions supported by local actions such as the improvement and recovery of the water springs systems by integrating civil society to broaden the awareness about the water development and governance model in RMSP. Therefore, it is possible concluding that the decision about the risk of stopping the water supply in RMSP between 2013 and 2016 was made in a centralized way, due to the strong action of the State government and private companies. The decision-making process did not take into consideration the legal hydric resources milestone in RMSP, since it legitimizes the decisions made by Alto Tietê Watershed Committee.

The actions taken by the dominant coalition were based on a merely technical discourse, and on classified information, rather than on transparency. It put aside

any attempt of integrating with other coalitions and with civil society, in general, due to the monopoly of all political and economic resources available to implement its propositions. These decisions result from the assumption that future choices for water management will be similar to the current ones, with not much technological development and with measures capable of promoting solutions that would profit on water supply and that would only fulfil generic needs of the public. In other words, these decisions focus on short-term solutions aiming at capturing water from sources farther away from the supply location rather than at locally rethinking the resource consumption ways. The argument lies on measures ruled by the technical mentality of managers who are used to suggest large-scale solutions based on top-down decisions, including little, or none, social participation. The instruments of water policy come ready to Alto Tietê Watershed deliberative councils, a fact that turns these councils into a consultant or gives them a mere informative nature.

Based on the uncertainty, mistrust and incapacity scenario reflecting the difficulty of public managers to provide concrete answers to society about the hydric crisis, many initiatives rise from society organization. Because they are aside from the discussion and decision-making process concerning the crisis, these initiatives are run by non-governmental organizations and by social movements that advocate for the right to information and transparency. These educational forms of engagement to the transversality of groups, interests, and social and cultural movements in life, politically potentiate the rigid structures of formation of the subject and the groups they belong to, since they favor and encourage the dialogue between many social actors in the opposition coalition. Many organizations focused on environment conservation, hydric resources specialists, and scholars are questioning the lack of transparency about the hydric reality, which makes it infeasible to find an answer that socially contentes the impacts from the lack of water and brings the risk of having the system and the suggested solutions collapsing.

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The boarding room for the Central Arizona Project (CAP), where water flows are distributed all along the state.

REINVENTING WATER CONSERVATION

Coalitions for Water Policy in the American West

Brian O'Neill, Joan Cortinas, Murielle Coeurdray and Franck Poupeau

Introduction: Ecological Transition and Water Conservation

In a context of uncertainty linked to the ecological transition, the issue of managing the scarcity of natural resources has become an essential factor in the study of environmental policy (Markard, Raven, Truffer, 2012; Lubell, 2013; Hornberger, Hess, Gilligan, 2015). Faced with the collective ideals of the "governance of the commons," (Ostrom, 1990; Ingold, 2008) crisis situations are particularly revealing of ongoing changes (Bakker, 2010; Barraqué, 2011; Lascoumes, 2012). From this point of view, the drought that has affected the American Southwest for the last fifteen years illustrates the difficulties encountered in terms of regulating the environmental impact of human activities (Lynn-Ingram, Malamud-Roam, 2013). This chapter aims to examine the implementation of ecological measures in water policies which, traditionally, have been subordinated to the imperatives of the region's economic development (Worster, 1985; Reisner, 1986; Pincetl, 2011).

For the last fifteen years or so, the American West has been suffering from the effects of a serious drought, a situation that has led to reductions in water use (Garfin et al., 2013). However, drought is not just a natural phenomenon linked to a decrease in rainfall or to a decline in water flows in rivers due to climate change and changing rates in glacier melt upstream. It is connected to a broad range of social factors associated with land use and water provision. In the USA, the states located to the west of the 100th meridian are drier and subject to higher variations in precipitation than are the states to the east of this line (Mount et al., 2016). However, the vast swathes of farmland located in these areas require substantial irrigation systems. Most water still goes to agro-industry: 77% in California, 79% in Arizona, 90% in New Mexico, etc. (Howitt et al., 2015) Moreover, the expansion of urban areas and the economic activities carried out in those areas, many of which are located at a substantial distance from sources of water supply, implies the construction of large water storage and transport systems, as well as an intensive use of groundwater (Glennon, 2004). Water outages have already affected a number of states, causing the governors of Arizona, California, etc. to declare states of emergency. Since the first decade of the Millennium, watersheds including the

Colorado River Basin have experienced not only low levels of rainfall and snowmelt, but also high temperatures. This has had a negative impact on the balance between supply and demand (Barnet et al., 2008). While measures introduced in the cities have succeeded in minimizing effects on retail consumption, the agricultural sector has proved to be more vulnerable.

In 2015, farmers in the Central Valley in California saw their provision of surface water decline by 50%. In all states, water outages and the growth of competition for available resources have generated disputes eventually leading to litigation. As well as Arizona state institutions, the federal government is also on the frontline. As owner of most of the land in the American West, on behalf of which it financed mega infrastructure projects throughout the 20th century, it now supports agriculture programs and provides climate risk funds. There are, in all, more than twenty federal agencies involved in drought management (Federal Emergency Management Agency, Department of Agriculture, including the US Forest Service, Environmental Protection Agency, Army Corps of Engineers, Department of the Interior, encompassing the Bureau of Indian Affairs, the National Park Service, and the Bureau of Reclamation, etc.).

Furthermore, although it has become an urgent political priority, drought is not a new problem in a region in which, since the 19th century, the purpose of major infrastructure projects (dams, canals, reservoirs, etc.) has been less to avoid water shortages for resident populations, and more to promote economic growth. At first used primarily for agricultural purposes, the emphasis shifted to an urban use of water (from both surface and groundwater sources) associated with a labor market increasingly oriented toward the production of manufactured goods and the provision of services in a context of fierce demographic growth. Throughout the 20th century, the conquest of new borders has been intimately linked to a desire to transform the arid lands in the American West into the bread basket of the East (Cronon, 1992), a kind of "oasis in the desert" (Gober, 2006; Logan, 2016).

An analysis of the situation of one state in the American West – Arizona – is of particular interest in terms of understanding policies designed to deal with drought and the effects of climate change. The protagonists of the water sector (engineers, public administrators, politicians, consultants, academics, etc.) often present themselves as the guarantors, if not of the ecological cause, then at least of "sustainable" and "responsible" development – an approach that marks them out from the elites of neighboring California, whose stance is characterized by anxiety, or even consternation (Bohn et al., 2016; Fleck, 2016). It has been argued that, thanks to its specific situation, Arizona has accumulated decades of experience and elaborated a politico-administrative framework oriented toward a form of balanced water management in which various institutions implement ecosystem protection programs and water recycling projects, referred to here as "water conservation". Conservation refers to public policies designed to "protect species, ecosystems

and their processes, and support their contribution to human wellbeing" (Lopez-Hoffman et al., 2009) as well as to develop more specific water conservation measures (Sheridan, 2014). Pima County, located in the south of the state, is generally recognized as being a pioneer in this area. The authorities of this county and of its main city, Tucson, have promoted plans for conserving soil and water since the 1990s, and many systems based on this same model were later implemented in most of the major agglomerations. In a state like Arizona, with its deep-rooted Republican values and affection for individual entrepreneurship (Biggers, 2012), such an approach to environmental issues may be surprising.

Water conservation has a long history in the American West. In certain regards, water conservation policies have been consubstantial with the construction of major infrastructure projects beginning in the early 20th century (Taylor, 2016). From the outset, these megaprojects have generated land use disputes and concerns about the over-exploitation of water resources (Walton, 1993; Espeland, 1998). However, the objective of the "conservationist crusade" (Hays, 1969), supported by leading engineering companies (civil engineering firms, mining companies, etc.) and federal agencies (United States Geological Survey, Forest Service, Bureau of Reclamation, etc.), was not to protect biodiversity, but to counter the harmful effects of an uncontrolled industrialism on the natural environment in which companies operate, a process which could put a break on economic growth (Gottlieb, FitzSimmons, 1991). A few decades later, in the early 1960s, ecological ideas were, under pressure from the environmentalist movement, incorporated into institutional policies, such as the Environmental Protection Act (1970) and the Clean Water Act (1972) (Tatenhove, Leroy, 2003; Kraft, 2015).

Water conservation in Arizona today has specific characteristics. It is not the monopoly of engineering companies operating in the name of Science on behalf of collective wellbeing. Instead, it is part of a broad range of participatory initiatives taken in residential communities by environmentalist organizations in the State and by municipal and county administrations: "the collaborative conservation movement works to weaken the rural-urban divide through hundreds of local projects" (Sheridan, 2014). Water conservation is now accepted by water managers and political decision-makers in Arizona insofar as it is not hostile to the region's economic growth. It is as if the issue at hand was how to promote, simultaneously, the protection of natural resources and the spirit of entrepreneurship. To the degree that these ideals have traditionally structured water policy in Arizona (Gottlieb, 1988; Colby, Jacob, 2007), the move toward water conservation might be thought of as a result of the drought, which obliges political leaders to focus on water provision in the region in general and the cities in particular.

The working hypothesis developed here differs from this vision by incorporating the analytical approach of the Advocacy Coalition Framework (ACF). The intention is to demonstrate that the adoption of water conservation policies originates in a

realignment of the dominant coalitions active within Arizona's political institutions. Consequently, the reasons for adopting such policies have more to do with the production of an institutional consensus between the various protagonists in the economy and management of water in the region than they do with the putative victory of an ecologist discourse that is finally getting a proper hearing. The task before us is, then, to show how water conservation reactivates ecological ideas within a new political configuration. The purpose of this chapter is, therefore, to analyze the links between coalitions and the implementation of water policies, or, more precisely, to explain how a "minority coalition" has succeeded in promoting measures that have gradually gained the upper hand among the State's water managers.

The chapter demonstrates, first, how the theoretical approach of the ACF can be used to reveal the emergence of a specific water policy designed to deal with drought in the American West. In order to explore the hypothesis that there has been a realignment of coalitions in favor of water conservation, a socio-historical perspective has been applied to defining the levels of implementation and articulation of water policies involving federal and national agencies, county administrations, municipalities and professional water user associations. This perspective offers a deeper understanding of the often invisible issues inherent in ongoing conflicts over the distribution of water (mainly from the Colorado River), as well as of the specificities of water management in Arizona. The milieu of managers in the water sector is then studied with a view to shedding light on the beliefs shared by a new coalition of policy-makers. The conclusion presents an analysis of the degree to which an examination of the socio-professional characteristics of the "protagonists of the water sector" (Lorrain, Poupeau, 2016) contributes to a valid sociological approach to political decision-making processes by, on the one hand, incorporating additional theoretical and methodological frameworks, and, on the other, placing those frameworks at the heart of scholarly debates about the role of the State.

Theoretical and methodological framework

The social dynamics of coalitions

The Advocacy Coalition Framework analyzes the degree to which the *policy process* defines problems as political and liable to institutional remedy, and examines the ways in which the different social groups concerned appropriate those problems in various ways (cognitive, critical, etc.) (Sabatier, Jenkins, 1993). The areas examined include not only education, criminality and unemployment, but also the environment (air pollution, the protection of ecosystems, water management, etc.) (Munro, 1993). This analytical framework is of particular interest in the case of a public problem such as drought management in Arizona, where a broad range of

organizations are involved in institutional discussions and frameworks: "the utility of focusing on advocacy coalitions as critical means of simplifying the hundreds of actors involved in policy change over a decade or more. An advocacy coalition consists of actors from a variety of governmental and private organizations at different levels of government who share a set of policy beliefs and seek to realize them by influencing the behavior of multiple governmental institutions over time" (Sabatier, Jenkins, 1993: 212). The Advocacy Coalition Framework is thus a "subsystem" encompassing not only decision-making institutional bodies, but also everybody involved in the process, from the members of official organizations to journalists, consultants, and scientists.

Another interesting aspect of the ACF is that it highlights the importance of the shared beliefs thanks to which coalitions are able to apply their programs (agreeing on objectives, perceiving relations of causality relative to specific phenomena, etc.) (Jenkins-Smith et al., 1991). Members of subsystems share a central core of normative axioms; those axioms are implemented within the subsystem via secondary elements taking the form of instrumental decisions and political strategies. While these shared axioms may be resistant to change, other levels of beliefs and values are more flexible. Political change comes either from events external to these subsystems (changes in socio-economic conditions, public opinion, etc.), or from internal events (changes within political parties, election results, etc.), or from lessons drawn from previous policies (policy-oriented learning), or, lastly, from negotiations and agreements involving at least two coalitions. The Advocacy Coalition Framework's approach is, therefore, particularly appropriate to an analysis of how the drought affecting the American West since 2010, and impacting all the States that, to varying degrees, depend on the Colorado River for water supplies, constitutes an "external factor" capable of transforming water policy, without however being the only explanatory factor.

There are two other reasons why the ACF is particularly applicable to water management in Arizona. First, the emphasis on shared beliefs encourages a tendency to ignore known conflicts and focus on the development of a consensus among water managers in Arizona about approaches to drought. On the other, it draws attention to a "minority coalition" articulated around the authorities in Pima County, the capital of which is Tucson, Arizona's second biggest city. In effect, Pima County represents a form of ethics oriented toward the protection of natural resources and the promotion of a balance between human needs and the environment. In a certain regard, it provides a positive model for water conservation, in opposition to the one applied in mega-cities such as Phoenix, the capital of Arizona (Ross, 2011), and, to an even greater degree, Los Angeles (Gottlieb, 2007) and Las Vegas (Nyies, 2014), which incarnate, in their respective states (California and Nevada), the catastrophic effects of uncontrolled development. The Advocacy Coalition Framework makes it possible to develop the hypothesis according to which Pima County has served

as a vector of transformation within the subsystem of water policies in Arizona by encouraging the creation of a new coalition capable of imposing formerly minority beliefs and values on all managers in the water sector.

While this hypothesis is the result of a synthesis of our field survey on water managers and the Advocacy Coalition Framework (Massardier et al., 2015), it nevertheless incorporates theoretical and methodological tools that the ACF does not, at first sight, provide (Bergeron et al., 1998). The limits of the ACF have already been highlighted, notably an "over-emphasis on beliefs rather than interests" which engenders "an analytical framework that concentrates too much on the cognitive dimension in the orientation of the strategies of actors" (Hassenteufel, 2016). Moreover, its focus on institutional architecture as a key to understanding forms of cooperation makes it impossible to take into account either particular courses of action or the adoption of specific beliefs (Lubell et al., 2014). The field survey thus encouraged us to expand the initial theoretical framework, which proved to be sufficiently open to encompass the social dynamics inherent in the realignment of dynamics. Based on the results of the questionnaire, two main explanatory hypotheses were developed, the first being that the production of a consensus on water policy is the effect of an institutional architecture characterized at once by the interdependence of institutions and by the fact that none of them have a monopoly in terms of the policy process (Teisman, 2000); the second being that the interactions between the various protagonists in the field of water policy are highly structured, not only by organizational hierarchies, but also by the career paths of water managers, in which the importance of technical and institutional skills is of central importance (Molle, 2009).

The specificity of Pima County, Arizona: Local conservationism and federal norms

The 1998 Sonoran Desert Conservation Plan (SDCP), which, while not specifically targeting water, focuses on ranch conservation and the protection of natural habitats and biological corridors, as well as on the restoration of riparian areas and historical and cultural heritage, can be seen as the birth certificate of conservation policies. Now considered in the United States as a trailblazing program, the SDCP concentrates on protecting 44 species threatened by urban expansion, conserving working ranch lands and protecting vast areas of open space. A scientific committee mainly comprised of biologists and ecologists from the University of Arizona, but also from the consultancy firm, Recon Environmental Inc. of San Diego, decides which initiatives on threatened species of fauna and flora should be taken and when. On this basis, the Land Use Plan was adopted in 2001, setting up the Conservation Land System, which imposes restrictions and genuine planning schedules on new constructions, and protects at least 80% of natural spaces around Tucson. The

SDCP thus represents an attempt to regulate the real estate market. In 2004, the county's voters approved a credit of 174.3 million USD (in the form of a bond fund) so that the county administration could acquire privately owned parcels of land located in sensitive areas of the Conservation Land System. Although the fund was discontinued in 2015, the initiative has since acquired other sources of financial support at both the local and State levels (Chuck H., Pima County administrator, Interview, July 2015). Initially articulated around territories surrounding Tucson, conservationist policy was gradually developed in the first decade of the Millennium, via a whole series of water conservation measures applied across Pima County, encompassing domestic water reuse, collective uses of storm water, restoration, etc. (Pima Association of Governments, 2006).

In ecological terms, there is nothing radical about the measures promoted by Pima County. They are part of a strategy focusing on compatibility with local development. Indeed, conservationist rhetoric is employed by entrepreneurs and political decision-makers whenever the issue of drought – considered both as a natural phenomenon and as the object of public initiatives designed to counter its effects – cannot be avoided. While one can point to an "instrumentalization" of environmental ideas to legitimize the pursuit of growth – "business environmentalism" to use Dorceta Taylor's phrase (Taylor, 2016) –, it is also possible to view this approach as offering a platform for green ideas, putting them into the public domain and helping them acquire "social acceptability" (Mayaux, 2015). And, to an even greater degree, because water conservation is not, at first sight, incompatible with economic objectives, it contributes to the emergence of a consensus about how the resource should be managed and – to apply the paradigm of the ACF – imposes itself on the terrain of beliefs and ideas.

The survey and its terrain: Methodological approaches and data collection

The survey of water managers focuses on the district of Tucson. Tucson is supplied by the Colorado River via a mega-structure, the Central Arizona Project (CAP), a 336 miles long canal managed by an organization of the same name employing 500 people belonging to Arizona's State administration. The CAP not only supplies water to half of all agricultural activities and most industrial activities in Arizona, but also, and above all, to five million private individuals. The City of Tucson is particularly dependent on the CAP in that the various rivers in this semi-arid region dried up several decades ago due to the impact of humans (Serrat-Capdevila, 2016).

The Tucson region contains a network of institutions involved in the fight against drought (Mott Lacroix, Megdal, 2016). By attending public meetings on the subject (thematic workshops, district assemblies, consumer meetings, commissions, etc.), we were able to identify the degree of influence wielded by various protagonists. As the participants themselves admit, the issues discussed at those meetings go

beyond the immediate concerns of the city of Tucson and even the State of Arizona. A localized study of the fight against drought necessarily implies not only an analysis of the system of institutions involved in water management, the parameters of which are not limited to the initial scope of the survey, but also encompasses neighboring states confronted with a similar situation in regard to the distribution of water from the Colorado River.

The choice of methodology for the survey was based on two approaches. The first consisted in contacting the directors of institutions considered to wield influence on drought management in southern Arizona (local administrations, municipal companies, State and federal agencies, etc.). Insofar as the private sector is concerned, real estate promoters were targeted as a priority due to pressure on natural resources exerted by urban growth in Tucson and, more generally, in the Sun Corridor between Phoenix and the Mexican border (Benites, 2016). Lawyers involved in water disputes were also contacted. A second approach consisted in asking interviewees for contacts with people who worked with/for them, or who, in their view, played a role in the implementation of water policies. The survey was, therefore, based on the principle of snowball sampling (Strauss, Corbin, 1990), an approach that enlarges the circle of interviewees in order to analyze relations between the various protagonists involved and shed light on pertinent coalitions.

Water policy in Arizona

A social history of various levels of action and the ways in which they are articulated

While it is true that water policies are inscribed within the broader objective of economic growth traditionally promoted by leaders in the region (Sabatier, Weible, Ficker, 2005), the Advocacy Coalition Framework makes it possible to go beyond "traditional notions of « iron triangles » – limited to administrative agencies, legislative committees, and interest groups at a single level of government – to include actors at various levels of government active in policy formulation and implementation, as well as journalists, researchers, and experts on policy analysis" (Sabatier, 1988: 131). Consequently, three different phases can be distinguished in the implementation of water policy since the 19th century, each of which corresponds to changes in dominant coalitions. More than just successive stages, these phases are analytical breakdowns of multiple processes which, in reality, are combined and superimposed in terms of representations of water policies ("beliefs and values," in the vocabulary of the Advocacy Coalition Framework) and of alliances between social groups struck with a view to transforming those processes and beliefs into instruments of public action.

The first phase, which started in the late 19th century and ended in the 1920s, covers the genesis and implementation of a federal water policy characterized by mega hydro and hydroelectric infrastructure designed to develop an America of "small landowners." In reality, this infrastructure served the needs of the agro-industrial sector (Cortinas et al., 2016). Promoted by a coalition of government agencies (within which engineers imposed a technico-scientific vision of development), and of local economic leaders, it provided a basis for the projects undertaken in the following decades. In the second phase, which lasted up until the 1960s, the focus shifted from the federal to the regional level, in which the representatives of Arizona (governors, senators, lawyers, etc.) lobbied in favor of new sources of supply with a view to guaranteeing the development of the State (Coeurdray et al., 2016a). A legal dispute over how water from the Colorado River should be shared pitted California against Arizona, with the latter eventually ensuring that the Central Arizona Project was constructed. Water policy was thus decided at the state level, where negotiations were carried out by lawyers and politicians (August, 1999). Between the late 1960s and early 1970s, a third phase emerged. A combination of pressure exerted by the environmentalist movement, the introduction of strict environmental norms by the federal government, and budgetary restrictions sounded the death knell for major infrastructure projects and encouraged a focus on local, participatory management approaches (Sabatier, Weible, Ficker, 2005). In Phase 3, water policies were and continue to be implemented by municipalities, county administrations and private protagonists. Within local coalitions negotiating the implementation of federal norms, promoters play a fundamental role. In effect, they provide impetus for the construction of water networks capable of guaranteeing the expansion of the real estate market.

Over the course of the 20th century, the focus in water policy shifted from the federal to the state and, eventually, to the local level. Of course, the institutions at each level did not disappear at the succeeding level, but instead continued in a sedimentary state. What we find in these transformations in various levels of action is the idea of the "invisibility of the State" (Howard, 1997). To verify the hypothesis of the emergence of a conservationist orientation, which in a sense constitutes a fourth phase of water policy and the coalitions by which it is underpinned, it is necessary to analyze the ways in which drought acts as an "external factor" capable of triggering transformations in the system under study. Such an analysis sheds light on institutional structures, notably on the promotion of an ensemble of initiatives (meetings, drought plan commissions, task forces, etc.) introduced with a view to adjusting water policies to the urgency of the situation. The origins and diffusion of these instruments of action must be understood (Lascoumes, Le Galès, 2005). The approaches taken by federal institutions, which would, ordinarily, be encompassed in environmental norms, become more visible as the basis of measures introduced at the State and municipal levels. In this sense, drought encourages meetings between

water managers who would normally have no cause to see one another, and it provides an impetus for the development of programs at all levels. Consequently, the objective was to determine the main institutions involved in Arizona, and to define the various levels and legal and regulatory frameworks at which they operate.

Institutional architecture and the production of consensus

The institutional architecture of water management in Arizona is based on the corpus of legislation introduced at the beginning of the 20th century in the Laws of the River, and the Colorado River Compact (1927), which determined how water is distributed among the states of the Colorado River Basin (Coeurdray et al., 2015) and, following the doctrine of "prior appropriation" (O'Neill et al., 2016), defining the respective prerogatives of those states in function of their water rights. The need to supply additional water to a region that was undergoing rapid demographic expansion after the Second World War encouraged the political elites to lobby for the construction of water and hydroelectric infrastructure (Buys, 2011). In the 1970s, the Carter administration called into question the cost of those projects, rendering the construction of the Central Arizona Project dependent on the Groundwater Management Act (GMA), drafted with a view to protecting groundwater sources from being abused. Introduced in 1980, the GMA created a number of administrative subdivisions in the State, but its sociological impact was, above all, to trigger the emergence of a group of water managers tasked with applying new regulations at all State levels. Federal experts and engineers were therefore encouraged to work with administrative managers at municipal and county levels. Most water services in Arizona's major cities are, in effect, managed not by private companies, but by public sector operators, for example, Tucson Water and Metro Water in Tucson, and the Department of Water Resources and the Salt River Project in Phoenix (Coeurdray et al., 2016b) – without forgetting the CAP, water from which is used to replenish groundwater tables from which a huge amount of water was pumped over the course of the 20th century. A system of water credits managed by the Arizona Water Banking Authority is used to manage the distribution of water between different sectors of activity.

If water conservation might seem to be the expression of a local realignment of coalitions, the Groundwater Management Act provides an example of the persistence of State and federal levels of action, which serve as resources in the struggles and processes that characterize the construction of coalitions. The way in which various levels of water policy are articulated must be taken into account, in that, in relation to the drought, water management in Arizona involves, for both historical and conjunctural reasons, a vast array of different institutions. Since the introduction of the Groundwater Management Act, water managers have gradually formed a fully-fledged professional milieu which, although encompassing a multiplicity of different points of view, is nevertheless characterized by an ensemble of shared beliefs.

On the one hand, it is generally accepted that the Arizona authorities know how to manage drought and that, since the state was founded in 1912, they have had to deal with problems associated with boosting economic development in an arid context (Sheridan, 2012). This idea was mentioned both by directors of State agencies and experts working in various public and private institutions (ADWR, 2014). According to the Director of the City of Phoenix Water Services Department, "*in Arizona, we have learnt to manage drought for more than one century, we know how to handle it*" (Kathryn S., Interview, June 2015). On the other hand, the view was expressed that Arizona's accumulated expertise makes it possible, if not to resolve, then at least to avoid disputes, and that the quest for a consensus constitutes at once the goal, the means and the precondition of effective "water governance." This is the main difference between Arizona and California, a spendthrift state whose motor role in the regional economy is based on an over-exploitation not only of its own natural resources, but also those of neighboring states (Reisner, 1985; Worster, 1986). California refuses point blank to renegotiate agreements which, on the basis of largely over-optimistic predictions about available water supply, guarantee it the lion's share of Colorado River water (Summit, 2013). In comparison to their profligate neighbor, water managers interviewed in Arizona presented their initiatives as sober, prudent and based on realistic forecasts about the future of the resource.

This consensus about the "sustainable" objectives of water policy and their compatibility with the economic development of the region involves not only the directors of State agencies, but also city administrators and leaders of local environmental organizations. Jeff T., Statewide AMA Director at the Arizona Department of Water Resources (ADWR), who set out on his career as an engineer in the Pima County Wastewater Reclamation Department, before holding positions in a variety of regional water agencies, affirms that "*finding an equilibrium between economic development of Arizona and ecosystems conservation is one of the goals of ADRW, meanwhile we stay in the frame of the environmental norms of the state code*" (Interview, July 2015). This reflects the position taken, albeit in a different register, by Liza S., head of the ecologist organization Watershed Management Group, when she promotes initiatives to safeguard the watershed around Tucson. Citizen action makes it possible to protect water that "renews your spirit, recharges our land, and so much more. With water, we give you shade, food, beauty, community, and hope". But she points out that this conservationist approach must be financed, notably to establish a "water balance model", a tool shared "with area residents, policy makers, and land managers" (WMG, 2015).

It would, therefore, seem unthinkable to promote water conservation policies that fail to pay heed to economic interests. The risks associated with drought mean that it is imperative to develop "good practices" and "good governance" guaranteeing water supply. While environmental concerns are taken into account, they are not

treated as ends in themselves. Instead, they are subordinated to the needs of collective wellbeing, with an emphasis placed on economic development. Rather than focusing on the protection of ecosystems and biodiversity, water managers emphasize the importance of conserving the resources required to underpin the state's continued development. Their discourse establishes a consensus, at once broad and flexible, that covers a variety of approaches to balancing economic and ecological needs. It is in this context that water conservation in Pima County has succeeded in realigning water policy coalitions and promoting new beliefs based on local initiatives.

Anti-drought coalitions in Arizona

The characteristics of the water policy network

The network analysis based on replies to the questionnaire reveals a specific structure in the system of relations between the various actors in the sector that can be described as a multi-centered institutional architecture that includes several different types of institution *(Cf. Figure 10.1, The structure of the network, p. 432)*. The density of the network is relatively low (0.032). Many nodes are not in contact with others, and paths from one point to another have to pass through more than one node (2.7 on average). It is therefore possible to anticipate a number of "structural holes" (Burt, 1992) which confer on certain intermediary individuals an important role in exchanges between different groups. To understand the impact of this institutional architecture, it is necessary to explore the components of the network in detail.

From the point of view of centrality, we should note the importance of the members of two state agencies, the ADWR and the CAP, as well as of certain institutions that depend on them, like the CAGRD, or which enjoy regional influence, like the Phoenix City Hall (nearly 2/3rd of Arizona's citizens live in the city) and Pima County (in which Arizona's other major city, Tucson, is located). The network's fragmentary nature helps to reinforce the importance of a number of "weak links" whose positions are boosted by "go-betweens" like Kathy C. (Prima County) and Wally W. (Tucson Water), who represent their institutions at most state or inter-state events in the Colorado Basin.

According to Teisman (2000), a multi-centered institutional architecture is characterized by the interdependence of institutions that it encompasses and the lack of a monopoly over the control of the policy process by any one of those institutions. The structure of the network clearly points to the fact that the state agency ADWR has a mandate to govern and regulate water distribution. But it also suggests that it needs other institutions, especially local operators like Pima County and the City of Phoenix, in order to be able to carry out its missions. In effect, the

network's institutions have specific competences which are often complementary. And while the ADWR's function is a regulatory one, it is the institutions that manage given territories, like Pima County and the cities of Tucson and Phoenix, which have the capacity to physically affect water distribution, for example, via water recycling measures, or restrictions on construction projects on municipal land. The fact that the central institution needs other institutions both to legitimize its actions and render them effective obliges it to seek *a minima* consensus in regard to water policy. In a context marked, on the one hand, by drought, and on the other by the imperative of economic development, the injunction to conserve water as a resource in order to keep the economy going can be seen as a way of manufacturing that consensus. This hypothesis must be verified through an examination of these beliefs based on an analysis of the questionnaire to which water professionals replied *(Cf. Figure 10.1, The structure of the network, p. 432)*.

From beliefs to instruments

An analysis of answers to the questionnaire reveals four distinct groups[1], which were constructed on the basis of hybrid clustering[2]. If we make a link between the orientations of water policy and the organizations to which professionals in the water sector belong, it becomes apparent that the priorities of *institutional conservation* (blue dotted line) tend to be promoted by state administrators (blue dots), while the priorities of *ecological conservation* (green dotted line), which place the preservation of ecosystems above all other concerns, tend to be promoted by the members of regional institutions and/or civil society – counties and NGOs, and the universities and municipal water distribution companies of Tucson and Phoenix. On the other hand, those entities advocating the priority of economic development include state institutions (blue dots), consumer associations, and administrators of rapidly expanding cities (orange dots) (except Tucson and Phoenix), while champions of *management and planning* include professionals with a high degree of expertise in the

1 The questionnaire was divided into a number of different sections covering perceptions of the causes of the water crisis, recommendations for necessary solutions, types of instruments on which to focus, forms of collaboration with other protagonists of the water sector, and academic and professional itineraries.

2 The hybrid clustering technique employed two combined traditional methods of iterative classification, Ascending Hierarchical Classification (AHC) – also known as hierarchical cluster analysis (at each iteration it seeks the partition that maximizes inter-class variance and, therefore, minimizes intra-class variance using Ward's criterion), and K-mean clustering (which, based on initial centers, affects, in an iterative manner, an individual at the center closest to them based on classical Euclidian space). Hybrid clustering is divided into three stages: 1. Seeking out stable groups by cross-referencing two K-mean partitions; 2. Selecting an optimal distribution from the Ascending Hierarchical Classification based on stable groups; 3. Consolidating the optimal distribution by means of a final K-mean clustering analysis.

water management in local, state, and private institutions. From the point of view of coalitions, one can see not only the somewhat unsurprising emergence of an alliance between the advocates of the two conservationist approaches, but also supporters of the management and planning approach. A systematic study of the answers given in the questionnaire reveals more precise coherences between the characteristics of the groups and the beliefs by which they are informed *(Cf. Table 1, below)*.

Table 1 - The characteristics of groups of water professionals

Group	Local professionals	Local conservationists	State administrators	Expert managers
Perception of the situation	No conflict, irrigation problems	Risks to ecosystems and human water use	No conflicts and avoidable risks	Resolution of technical problems
Water policy priorities	*Economic Development*	*Ecological Conservation*	*Institutional Conservation*	*Management & Planning*
Level of action	Municipal	County, municipal, federal, state	State	State
Water policy instruments	Mobilization of local authorities	Planning, Participation	Legal and incentivizing action	Lobby
Type of expertise	Good management practices	Water administrator	Policy decision-making	Good management practices
Type of action	Management, local coalitions	Management and implementation of policies	Coalitions, regulations	Coalitions and lobbying

The two classes operating at the local level – cities and counties – are the farthest apart in terms of their positions on water conservation. The first class, which advocates economic development, includes individuals primarily belonging to consumer associations active in state institutions responsible for managing water, to industrial and agro-industrial lobbies, and to rapidly expanding cities (like Marana, on the outskirts of Tucson). In their view, the water crisis can, to a large degree, be attributed to agriculture and to costs associated with irrigation (which involves the construction of major infrastructure projects). They present their expertise in terms of a capacity for management armed with "good practices" in terms of the implementation of water policies; their approach is based on instruments encouraging the development of a water market in which water rights can be bought and sold depending on needs and storage capacity. This approach requires the intervention of a state authority, the Water Banking Authority, capable of imposing regulatory measures. We shall refer to the members of this class as "local professionals," a profile illustrated by Ken S., the director of the CAGRD (Central Arizona Groundwater Replenishment District), a regulatory institution responsible for overseeing the development of new plots of land *(Cf. Box 1, p. 307)*.

1. Ken S.: Conserving water for the future

Ken S's career as a water manager began when he first came to Arizona. Son of a Professor of Political Science, he grew up in Massachusetts, where he developed an interest in international issues (for example, he said, in the interview conducted in July 2015, that he visited the Middle East when he was at high school). He graduated with a BA in Political Science and Government from the University of Colorado, before moving to Tucson to study for a Master's in Geography at the University of Arizona. His interest in questions of water policy saw him recruited by the Water Resources Research Center at the University of Arizona, where he trained for six years as an engineer in the water sector. This skill set led to him being hired by the local branch of the ADWR in Tucson. Budget cuts that affected the agency during the 2008 financial crisis encouraged a move to the CAP, where he served as a Senior Policy Analyst, before becoming Director of Resource Planning and Analysis in 2012. He applied his broad range of scientific and technical skills, along with his experience in the sphere of water policy, to the development of a new management model for the CAP, the Service Area Model, based on a calculation of groundwater flows, particularly in urban areas served by the CAP. His position in favor of the State regulation of water conservation in response to the "challenges of urbanization" made him a central figure in the professional milieu. In the 2010s, he became an administrator in an institution – the Central Arizona Replenishment District (CARD) – initially set up by the real estate developers lobby to circumvent the GMA (Benites et al., 2016). His mission can be seen as to provide technical expertise about modelling and oversee adjustments to the distribution of CAP water to urban developments.

The second class of individuals mainly includes individuals associated with Pima County, which places a clear emphasis on conservationist policies underpinned by ecological concerns and on approaches taken by and for local communities (*ecological conservation*). In their opinion, the situation is characterized by uncertainties concerning the preservation of local ecosystems and the provision of drinking water for the least well-off members of society. In close contact with ecological groups – without, however, sharing their opposition to economic development –, their specific institutional management expertise consists in implementing ecological measures, either by striking alliances on the ground, or by promoting measures designed to protect natural milieus and recycle waste water. We shall refer to this class as "local conservationists," whose profile is represented by the administrator of Pima County *(Cf. Box 2, p. 308)*.

2. Squaring the circle: Chuck H., administrator of Pima County

Pima County Administrator since 1993, Chuck H. is a native of Tucson, where he went to university. Holder of a Master of Science in Civil Engineering from the University of Arizona, he is a professional engineer. After starting out on his career as an engineer in Pima County in 1974, he was appointed head of the new Department of Transportation and Flood Control in 1979 (frequent flooding during the monsoon months of July and August create numerous problems on the roads). He then served as the Assistant County Manager of Public Works from 1986 to 1993, before being elected to the post of County Administrator. Honored by the University of Arizona, he received national recognition for guiding the county to several "national awards in public works, disaster assistance and recovery, and environmental conservation." He is recognized as the "primary author of the nationally recognized Sonoran Desert Conservation Plan, which received the National Outstanding Plan Award from the American Planning Association" (APLDIG, 2015).

In our interview of July 2015, he was modest in describing his career at the head of a County Administration that employs over 7,300 people and has a budget of 1.3 billion dollars. First, he emphasized riverside and park development projects, and improving approaches to water recycling and the use of storm water (some of these projects received financial aid from the Army Corps of Engineers). He insisted on the importance of storm water in the fight against drought, both in terms of the production of recycled water and the conservation of the watershed's ecosystems. Storm water is used to replenish groundwater sources in areas in which Pima County is attempting to regulate urban expansion, notably by purchasing land on which to develop ranches and protected zones. This approach to the sustainable management of water resources is, according to Chuck H., a precondition of sustainable economic development. Even when he talked about Pima County's opposition to opening a mine on its territory, he pointed out that he was not against the project per se, but that he was, instead, critical of the technical approach by which it was underpinned and its impact on ecosystems. In his view, mining companies should focus on the use of recycled water rather than pumping aquifers or purchasing water from the CAP.

The action of the next two classes, unlike the two classes mentioned above, is not undertaken exclusively at the local level; indeed, it encompasses the entire state of Arizona. The third class is largely made up of individuals belonging to two state institutions, the Arizona Department of Water Resources (ADWR) and the

Central Arizona Project (CAP). It includes public administrators who are keen on legal instruments and have a more global view of the issues of water provision, which they often situate at the inter-state level (the Colorado River flows through seven states), without, however, neglecting local approaches to water reuse. This class of state administrators is characterized by its contacts with all the protagonists of the water sector (a fact confirmed by indicators of both centrality and intermediarity, which are the highest in the sample). Tasked with applying environmental laws and norms, they encompass various organizations responsible for the maintenance of major technical systems, for example the CAP. The director of the ADWR *(Cf. Box 3, below)* occupies a central position among professionals in the water sector, notably in regard to the implementation of state plans designed to deal with the drought, which essentially consist in institutional conservation measures.

3. Tom B.: The new face of water management in Arizona

In 2014, Tom B. was, thanks to his recognized expertise in the field of water management, appointed Director of the Arizona Department of Water Resources (ADWR) by Republican governor, Doug Ducey. Although he is not from the region (he graduated with a BSc in Geology from the State University of New York at Cortland in 1977), his first post in water management was an internship in 1982 in the Phoenix AMA, an administrative body set up following the introduction of the Groundwater Management Act. There, he continued his career, occupying various legal and administrative functions. He became a Programs Administrator in the Adjudications Division before being recruited, in 1988, by the City of Phoenix as a Hydrologist in the Law Department where he provided assistance to City management and attorneys on issues relating to the City's water rights, water use and water supply. He was swiftly given responsibility for the management of water from the Colorado River, notably as Chairman of the Arizona Water Banking Authority and Co-Chair of the Drought Interagency Coordinating Group. He also represents the State of Arizona in negotiations concerning the rights of Indian Nations. As an ADWR administrator, he held positions of responsibility in most official State institutions, including the Statewide Water Resources Development Commission, the Regulatory and Permitting Group of the Governor on sustainable water, the Statewide Water Advisory Group, and the Governor's Drought Task Force. Last, his work with academic institutions (the Julie Ann Wrigley Institute for Sustainability at Arizona State University, the Water Resources Research Center at the University of Arizona) put him in contact with most of the Expert Managers, whose scientific competencies are recognized at the State level. Unsurprisingly, his ➔

position as Director of the ADWR, politically the most important institution from a hierarchical point of view, makes him a central protagonist in the elaboration of water policy. He is an essential broker in the introduction of associated norms and rules.

The fourth class is principally made up of "private" organizations (state-level consumer associations, foundations, law and consultancy firms), as well as multi-positional water professionals in Arizona's management institutions. In terms of water policy, its members focus on instruments of formal action (water sharing agreements, etc.), but like local professionals, they tend to base their approach on private interests. Due to their characteristics, members of this class can be described *expert managers*, consultants with a background in engineering and, additionally, law and economics. Many of them have a career in a public institution, or have, after such a career, opened their own firms or work in private industry *(Cf. Box 4, below)*.

4. Bill P.: From engineer to consultant, an Expert Manager in the field of water policy

Bill P. grew up on a small farm in Vermont where he was active in "Young Farmer" associations at a very young age. He graduated with a BSc in Hydraulic Engineering, after which he was recruited in the late 1980s by the Bureau of Reclamation in Boulder City, Nevada. From there he was transferred to Yuma, Arizona. While in Yuma, he worked on dam and canal projects for the Wellton-Mohawk Irrigation District and on water supply to Mexico. His skills quickly attracted the attention of people in high places and he was appointed to a post in a new government program in Washington DC, the Planning, Programming and Budgeting System (PPBS), which, applied to the water sector, led to more water managers being trained. At the time, just under 90 engineers were appointed to seven elite universities (Harvard, Princeton, etc.). In his 2004 interview, given in the context of the Oral History of the CAP, he reported that: *"We had a lot of people start engineering. I don't remember the exact numbers but there was like 85 or 90 Civil Engineers. Four years later, six of us graduated. Most of them ended up in the Business School and became known at our college as "The School for Flunk out Engineers". But there are a lot fewer people, I believe, entering engineering now".* After graduating with a Master's in Engineering Economic Systems from the University of Stanford, he was recruited by the Secretary ►

of the Interior in Washington as water policy budget examiner, focusing on the CAP water canal project. He was also involved in the elaboration of a substantial number of Environmental Impact Statements, the first of which on the Auburn Dam in California, which was never built. In 1985, the needs of water administrations in the State of Arizona, along with the introduction of the GMA encouraged him to join the ADWR in Phoenix. He spent three years there as Senior Analyst and Manager for Water and Power Systems, before being appointed Director of the agency. Later, in 1991, thanks to his contacts and expertise, he was able to set up his own consultancy firm. His main area of interest is drought management, and he acknowledges, not without reserves, the strategic action of the State of Arizona, to which he himself has contributed: *"I really believe we ought to be able to do some cloud seeding up in the Colorado Rockies. I really do because no matter what we do, drought or no drought, were in a perpetual drought in Arizona. When I was Director of ADWR, I set up a team to try to define what a drought is. We couldn't do it. Now the Governor has a task force on drought and they've come up with about 15 definitions they've lifted from a lot of different places, but they really don't really apply here. We're in a perpetual drought. The question and what I told the Drought Task Force is that at least on the river to a certain extent in Central Arizona, we don't care what the weather is here."* (Interview, October 2015). However, compared to California, the State of Arizona can, in his view, be confident of overcoming the crisis, with the proviso that water conservation policies are applied over the long-term.

The problem here is to understand how these classes interact with one another to form coalitions, and, at the same time, how they influence the development of water policy. First, it can be observed that these classes are primarily made up of institutional protagonists who come across one another on a frequent basis at meetings, and on commissions and boards. The importance of Arizona state institutions (particularly the ADWR) is clear; in the context of drought they have to apply norms handed down by both the state and federal governments. Staging posts for measures decreed by local institutions, they also serve as points of reference which can be contacted by municipal managers. But their capacity to exert influence and their predominant role in the production of collective responses to the drought is also a relatively new phenomenon. Highlighting the agency's newfound influence in times of crisis, a former director of the CAP (Interview, July 2015) commented that: "*In the early 2000s, the ADWR was an empty shell.*" The Central Arizona Project, which manages the canal supplying the south of the state with water from the Colorado River, and which depends on the ADWR, also plays a key role in combating the risk of water shortages. As well as receiving forecasts from federal

agencies, it also acts as an interlocutor for the municipalities, whose representatives are often to be seen with the director of the ADWR at public meetings. Last, two institutions – the City of Phoenix and Pima County (including Tucson) – play a central role in the development of the conservationist coalition in Arizona, and not only due to their demographic influence. While they provide assistance to the ADWR in terms of ensuring water distribution, they in turn require the support of the state agency not only to fight against attempts to deregulate agriculture, but also, and above all, to rein in expanding cities and realty promoters who try to relax building regulations designed to guarantee water supply.

The social foundations of water policy coalitions

According to Sabatier and Jenkins (1993: 221-222), "changing government programs involves significant external disruptions and implies the skillful exploitation of opportunities by the minority coalition." It is legitimate to ask what specific skills Pima County has been able, in regard to the drought, to contribute to the development of a state-wide conservationist coalition in Arizona. In regard to this question, an analysis of the structure of the network reveals certain convergences, notably in terms of the perception of action instruments (i.e., "secondary elements" rather than "core beliefs" to use ACF terminology) (Le Bourhis, 2003). These instruments include the treatment of waste water, storage and refilling groundwater aquifers. It is in the sphere of the educational background of professionals in the water sector that the analysis of the network delivers the most explicit correlations (Cf. Table 1). First, in our sample, the advocates of conservationist policies (institutional or more radically ecological policies) have either a background in engineering (most often civil or hydrological engineering, or, for younger graduates of the University of Arizona in Tucson, environmental engineering), or, in certain cases, a background in the natural and social sciences. On the other hand, advocates of economic development have backgrounds in business and management.

It is apparent, therefore, that the conservationist coalition is based on relations between professionals with higher degrees in engineering, natural sciences and social sciences. The analysis of the network reveals not only the degree to which the development of water conservation policies involves local conservationists and state administrators, but also that it is based on technical skills linked to a background in engineering. Insofar as qualifications in natural sciences and social sciences are concerned, an examination of the academic careers of local conservationists and state administrators reveals that they have acquired technical skills either in additional further education courses, or in their first jobs, in which they were afforded the opportunity to familiarize themselves with technical instruments *(Cf. Table 2, next page; Figure 10.2, Educational background of the water managers, p. 433)*.

*Table 2 - Distribution of water policy orientations (rows) in function of educational background (columns)***

Educational background Policy orientations	**Business/ Mngt**	**Law**	**Admin.**	**Engin./ Hydrology**	**Natural Sciences**	**Social Sciences**	**Total**
Ecological Conservation	0	2	0	5	2	3	12
Institutional Conservation	1	3	2	5	5	8	24
Management & Planning	0	4	2	1	1	2	10
Economic Development	4	3	2	0	0	1	10
Total	5	12	6	11	8	14	56

*** The Khi-2 test between the two variables "Educational background" and "Orientations of water policy" based on the table in Appendix 1 (List of Surveys) is highly significant. The two variables are closely linked (with a 0.3% margin of error), particularly in regard to the following modalities:*
Ecological Conservation = Educational Background: Engineering/Hydrology
Economic Development = Educational Background: Business/Management

In effect, as shown in *Figure 10.3 (Educational background and water policy orientations, p. 434)*, Pima County's links were primarily forged with trained engineers occupying not only various functions in the ADWR and the CAP, both of them state institutions, but also decision-making positions at the local level in Tucson and Phoenix, which are keen on limiting the expansionist aspirations of towns on those cities' outskirts. The fact that they share a common academic background, often in Hydrology, in one or other of the State's two public universities (the University of Arizona at Tucson, and Arizona State University at Phoenix), doubtless contributes to the possibility of a technical dialogue concerning which instruments to apply. The possibility of finding a professional post in the state institutions whose mission is to implement the provisions of the Groundwater Management Act of 1980 (see above) can only serve to reinforce these convergences.

Furthermore, membership of the coalition is not restricted to the local conservationists of Pima County and Arizona state administrators. Indeed, water sector protagonists from other groups in the water sector have gravitated toward it. The rapprochement between expert managers and local conservationists is articulated around shared instruments (drought planning, water reuse measures, etc.)[3], rather

3 On the role of instruments as agents of change in the field of water policy, see Baudot (2011).

than around shared political objectives. Such instruments require technical knowledge and an understanding of the policies being implemented. Like the local conservationists and state administrators, the expert managers who joined the conservationist coalition also had a background in engineering and occupied important functions in public water agencies before turning toward consultancy work in the private sector and developing their approaches in decision-making milieus close to state institutions. Attentive to state and inter-state issues, they are capable of intervening in highly localized problems and providing expertise that takes into account broader arbitrages at the level of the Colorado River.

It was also due to this shared use of instruments and to the technical skills associated with them that a number of local professionals have joined the conservationist coalition. The Director of the Water Department of the City of Phoenix *(Cf. Box 5, below)* described additional mechanisms for the acquisition of shared skills underlying the adoption of water conservation instruments within the constraints of urban management. During our interview, she talked about the support provided by the City for measures designed to limit consumption and encourage water reuse. These measures do not reflect solid ecological beliefs underpinning the values of the City of Phoenix, but, instead, are the result of her assessment of the interests of the institution to which she belongs, which are largely defined by a concern with guaranteeing water supply for Phoenix and placing limits on the ambitions for continual expansion of surrounding towns and cities, which continually attempt to circumvent the 1980 Groundwater Management Act and exploit aquifers in order to obtain sufficient quantities of water for new construction projects. Furthermore, she recognizes the fact that, for obvious economic reasons, the interests of the Water Department are not served by a decline in consumption. Her organization's rapprochement with the water conservation coalition is, here again, based on the idea of sharing a certain number of water management instruments which respect state norms on groundwater resources and water recycling.

5. An ecological economy: Kathryn S.

Holder of a PhD in Resource Economics, Kathryn S. is director of one of the biggest municipal water distribution companies in the country. Phoenix Water Services serves 1.5 million consumers on a territory of 540 square miles (approximately 1,400 square kilometers), with an annual operations budget of $280 million. She is also responsible for the processing of waste water in the Valley of the Sun, the area in which Phoenix is located. The very size of the concession doubtless explains why so many initiatives are being pursued ►

there. As Sorensen herself says: *"Phoenix's water supply is sound and sustainable as a result of multiple water sources and a logical, methodical approach to supply planning, infrastructure management, conservation, and drought preparation. All of the city's highly treated wastewater is recycled and reused for crops, ecosystem restoration, aquifer recharge, and energy production at the Palo Verde Nuclear Generating Station. Phoenix's water and sewer rates are among the lowest of large cities nationwide".*
While she is, due to her institutional allegiance and the preferences that she declares, a "Local Professional," her position at Phoenix Water Services means that she is nevertheless able to bridge the gap between academic experts and consultants employed by the State. She is a member of the Scientific Committee at Arizona State University's Decision Center for a Desert City, of the Water Resources Research Center at the University of Arizona, of the Kyl Center for Water Policy at Morrison Institute, and of the Focus Area Council of the Water Research Foundation. She is also a member of the Rates and Charges Subcommittee of the American Water Works Association, a powerful professional association based in Denver, Colorado. The convergence of her interests with those of the conservationist coalition is expressed more in terms of the connections established at the level of State action in favor of collective equilibria than in terms of local concerns about ecosystems. Highly revealing of the instruments shared by the conservationist coalition is "Drought, Drought Everywhere: Arizona's Planning," the paper she delivered at the National Conference of the American Planning Association, held in Phoenix in April 2016. Kathryn S. spoke during the same session as Tom B., Director of the ADWR, where she shared his vision of an organized approach to future problems.

Conclusion: discussion of results and research perspectives

The objective of the survey presented here has been to explore the development of an anti-drought conservationist coalition. This coalition is articulated around what was originally a minority entity (Pima County), which was able to spread its ideas and management tools in a way convincing enough for them to be taken up by all the actors involved in drought management. The production of a relatively broad consensus concerning the implementation of anti-drought instruments is based on a bedrock of skills – in large part supplied by trained engineers – shared by most advocates of water conservation policy. An examination of this process shows that rapprochements between different groups at different levels of action (local and state administrations, public and private operators, consulting firms,

etc.) are based on a shared "technical capital," which conditions the choice of instruments. For this reason, it is legitimate to consider those instruments not as simple tools of governability revealing general beliefs (Sterner, 2016; Tirole, 2016), but as "second rank institutions" in the sense outlined by Dominique Lorrain (2008) or, in other words, as markers of institutional positions and organizational interests within administrations whose power is based on the control of natural resources (Molle et al., 2009).

The survey produced two kinds of results. From a theoretical point of view, our research provides an original contribution to the analysis of the process of production of public policies. It has already been observed that the "limited rationality" accorded to "actors" by the ACF framework (Bergeron et al., 1998) does not provide the means to understand the process via which an "external factor" can have the effect of realigning coalitions, and that that type of analysis is too often based on "conditions favorable to change" (Hassenteufel, 2016). In the case discussed here, factors leading to the adoption of one instrument rather than another are linked, on the one hand, to the multi-centered architecture of the water policy network, and, on the other, to the social and academic characteristics of professionals in the water sector. A system of institutions in which interdependence and the absence of a monopoly of any of those institutions in terms of regulation generates such a degree of uncertainty concerning results (Teisman, 2000) that conflicts are, in practice, either marginalized or ignored in order to produce a consensus. Agreements of this kind are all the more vague and formally flexible in that they are based on "second rank institutions" that can be used by everyone, for example the Drought Action Plan or water reuse measures. But if network analysis, like models of interactions and their social effects (Weible, Sabatier, 2006; Douglas Henry, 2011; Lazega, Snijders, 2016), is both a point of entry for empirical research (Boyer et al., 2007) and an indicator of the reciprocal impact of the institutional structure on policy, new variables should nevertheless be taken into account, including the type of educational backgrounds of professionals in the sector. Therefore, our research encompasses an analysis of the social determinants of systems of action, particularly the role of engineers and strategies for converting their technical skills and applying them to the development of water policy and of a conservationist consensus.

Finally, from the point of view of debates about the lack of transparency and the fragmentation characteristic of the United States (Béland, Vergnolle, 2014; Gensburger, 2011; Howard, 1997; Mizruchi, 2013; Orren, Skowronek, 2004; Skocpol, 1992), this research takes a relational and systemic approach to public policy (Dubois, 2014) based on an environmental theme largely neglected in the existing literature (except for Gunningham et al., 1998). As has been observed, in such a complex institutional space, the most central institutions require minor institutions to ensure that their policies are implemented. The alternative would

leave those central institutions with the arduous task of undertaking, unaided, the most difficult enterprises, for example conserving water in a state like Arizona, in which the influence of agro-industry and urban expansion encourage people to seek new water sources rather than to apply conservationist norms. In a context of adaptation to the ecological transition, which does not constitute the priority of the highest levels of the US Federal State, the fact that water conservation policies can now be driven by the institutions closest to the day-to-day management of natural resources doubtless constitutes a decisive agent for change in the approaches taken by economic operators.

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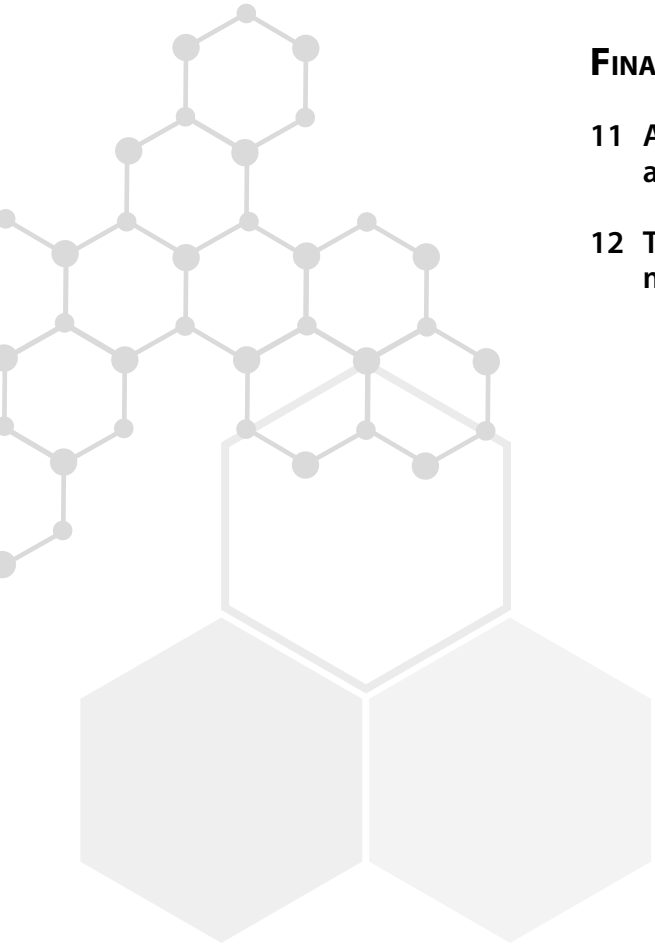
Final considerations



Final considerations

11 A controversy's relational approach

12 The ecologization of water management

A public meeting during the Zapotillo conflict.

A CONTROVERSY'S RELATIONAL APPROACH

Eric Mollard

Introduction: network analysis and qualitative analysis

For the particular case of an environmental struggle, this chapter proposes to empirically assess the gain that comes from a special form of network analysis, where actors are visualized with values they defend[1]. The contribution of this network analysis is compared to the qualitative analysis of controversy based on history, social practices and comparisons that document stakeholders' strategies. Each strategy of actors adjusts to the others and is in relation to the overall sociopolitical framework. The qualitative analysis of controversy here developed in comparison with network analysis goes beyond the series of events associated with the lived experience of actors. The qualitative analysis of controversy is clearly socio-political and includes the linkage between a governance and the controversy, echoing Jean Leca (1977), who called to report a sociopolitical system "more directly to the specified historical challenges", which here represents the fight against a dam that explains and illustrates the socio-political system (or governance).

In the first part, the opposition to the Zapotillo dam in Mexico is presented as a timeline[2]. The cast of stakeholders vying ten years after the beginning of hostilities provides the outline of the coalitions' structure. The second part exposes the results of the Zapotillo network analysis. The graph chart shows interpersonal relationships in order to identify values that reflect a coalition. It shows that values, specific to the case study, are more discriminating than the political values or positioning of actors. Thirdly, the balance sheet of the network analysis benefits is established. The objective of this contribution is to address this kind of quantitative input in relation to the socio-political analysis of both controversy and governance.

1 This type of network analysis could be named a Value-based Relational Graph.

2 Fieldwork was conducted with Lorena Torres Bernardino (UNAM-FCPyS Mexico), whose own network analysis is in chapter 4 of this book.

A context of dispute

Today's Mexico is marked by the resurgence of struggles against public or private projects of highways, airports, dams, housing estates, mines, etc. (Vargas et al., 2012). Rural areas are not the only ones involved as the most favored people withhold gas stations or terrestrial antennas in urban neighborhoods. Environmental protection is cited as a cause, but also cultural heritage safeguarding, human health, costs to the community or social justice are all interchangeable causes. As elsewhere in the world, civil society controls collective-action repertoire of professionalized struggles. However, Mexico is a specific slightest rule of law governance. Authorities and citizens are far from applying all laws. Flaws observed in administrative procedures are as many resources used in court and public opinion. At the same time, the international echo of a local struggle strengthens global narratives of environmental crisis and human rights. The Zapotillo conflict analyzed in this paper not only is the desperate struggle of local opponents, but also the enchanted fight for a contemporary issue.

Brief chronology

Announced in 2005 by President Vicente Fox and initiated a few years later, the Zapotillo project, to supply drinking water to the cities of Guadalajara and León in the states of Jalisco and Guanajuato in western Mexico, is still not completed in 2017. Its implementation comes after the withdrawal of three previous projects. The first of them, the Purgatorio Dam, was discarded due to opposition from local entrepreneurs who denounced an increase in costs for users and loss in industrial competitiveness. The two next projects were also abandoned after the opposition of Guadalajara's civil society, mainly academics and local NGOs.

The San Nicolas Dam project, which was to flood the small town of San Gaspar, gave rise to a dispute quickly settled in 2004. NGOs have relayed the inquiries to the government and supported the fight against the dam. As there was a technical alternative and due to various difficulties in the local government at that time, federal and state governments agreed, in 2005, to focus on the Zapotillo project, a dam of 80 meters height which would result in less relocation of people – and, supposedly, less resistance. On the other hand, the third dam project, Arcediano, downstream of the river just below the Guadalajara plateau, gave rise to a long dispute. The single displaced person who denied the dam has become a media icon. Guadalajara's NGOs expressed a special concern about the quality of water in a reservoir that would collect industrial and municipal wastewater. In 2007, the project was suspended in favor of the Zapotillo dam height rising from 80 to 105 meters.

The San Nicolas Project cancelation induced the 80 meters Zapotillo Project, and the Arcediano interruption in 2007 is the cause of enhancing the project to

105 meters high. The fight against Zapotillo, with a handful of regional NGOs allied to the village committee against the move, began in 2005. When the 105 meters high construction began, the fight did not end. In 2017, villagers and local NGOs allied in the "historic" coalition remained hopeful of the achievement of an 80 meters dam and a 10-meter protection wall. Indeed, the general contractor, Conagua[3], suffered a setback in 2014 due to the construction being halted by a Supreme Court order, when the dam was 80 meters. The appeal request was not the result of civil society, but of the local Congress, whose approval was not previously sought at the time of raising the dam to 105 meters, and which had still not agreed to it in 2017. The issue was then monopolized by political parties.

The Congress decision being discussed has been politicized when the solution relied on the decision of local representative members. A presidential decree early divided the waters of the river between the two cities of Guadalajara (metropolitan area of more than 4 million inhabitants) and León (1.5 million inhabitants). The abandonment of the Zapotillo rising is a difficult option because of the drinking water deficit and due to the future decision of another dam to be decided later on. Politically, local parliament members also consider that the denial of water transfer to León could cause retaliations on another river needed in Guadalajara. Indeed, in the past, Guanajuato farmers have blocked dams that supply Lake Chapala, which is the main water source for Guadalajara, where Representative members are not only subject to federal law agreements, but also to the situation of the other watershed in León jurisdiction.

The options discussed (80 meters with or without a flood barrier; 105 meters; with or without León water transfer) structured the 2015 coalitions. The river is entirely located within the state of Jalisco and opposition parties in Guadalajara seized the subject to promote the "sacred union" against the neighboring state. As for the governor, elected in 2012 and belonging to the presidential party (PRI), he had not yet revealed his position about the Zapotillo dam in 2017. Coming from the local political milieu, the candidate for Governor in 2012 was aware of the battle against the dam. Once elected, he developed a strategy that had two weaknesses. It first appeared in a tweet released in 2013, a year after his election: "*I repeat: Jalisco should be the primary beneficiary of the decisions and not the one who suffers. We will not flood Temacapulín*". Besides the desire to protect the village, which assumes a dam 80 meters and a controversial wall, he unveils a water state-focused regionalization strategy, meaning not to transfer water to León in case of lack of water in the river. The state regionalization is confirmed when he creates the Citizen Observatory for the Integral Water Management, which incorporates Jalisco's stakeholders and not those from León. Its twenty members are balanced between civil society and traditional stakeholders. Radical actors are excluded: the

3 The National Commission Water is responsible for water under federal jurisdiction.

federal and state government agencies in favor of the dam with full transfer of water to León in one hand, and historical NGOs and the village committee who fight against the dam on the other. Local universities and chambers of commerce are over-represented. Rural and urban associations able to territorialize water in Jalisco, that is to say, to deny the transfer to León, get eight representatives.

The first weak point of the strategy is the President of Mexico, who belongs to the same political party as the governor. The president, along with the federal government, supports the sharing of water between Guadalajara and León. Does the governor intend to pressure the president with his State population's support? It is hard to say. Still, the plan fails by the second weak point: Since its creation, the observatory enacts a set of principles about water that every elected representative has to enforce. But while the observatory stands against the transfer of water in León, as the strategy of the governor predicted, a majority of members required securing the villages from submersion by reminding the governor of his reckless tweet. An unexpected alliance emerges in favor of the historic coalition to protect the village from flooding, even if preferences regarding the dam, the protection wall, and the Leon transfer are heterogeneous. The Observatory opposition then draws on local scientists who contest federal hydrological calculations and estimate that the river doesn't have enough water to supply both cities. Facing the rebellion in 2016, the Governor contracted the international United Nations' agency UNOPS to resume the case and avoid the observatory. In 2017, UNOPS was collecting data to decide if the river has enough water for both cities.

The historic coalition, around two regional NGOs and the village defense committee with some allies, has never ceased to act for ten years. Its media and legal effectiveness requires Governors to take it into consideration. The tense political atmosphere has forced the Governor to create the observatory in 2012. The following year, the observatory opted for the preservation of the village from being flooded.

An opponent's example

Before characterizing coalitions in 2017, the Observatory's President allows us to understand the lived experience of opposition to the dam[4]. More than others, he mediates between local policy and opposition, and also, between the historical and territorial coalitions.

Engineer by training, entrepreneur in the agro-industrial region of Los Altos, where the dam is built, and a non-political promoter of development associations, the future president of the Observatory appears as the right man for the job in 2014. Close to the Catholic Church, he is also a network man. A prior appointment

4 Historic coalition's actors, such as internationally known Father Gabriel, are less indicative of the contradictions within the opposition to the dam.

at a River basin agency gave him some experience in water managements, a more negative than positive one according to him. He knows that the Zapotillo is a weakness for the Governor: he negotiates the appointment of Observatory members and demands binding resolutions for the Observatory. The Governor, who wants to territorialize water, accepts the requirements.

The president of the Observatory approached the two major regional universities: The University of Guadalajara, known for large student strikes and for the role of presidents in local politics; and the Jesuit University (ITESO), which, in the case of Zapotillo, is associated with a regional renowned NGO fighting for ten years against the dam. The University of Guadalajara and ITESO respectively coordinate technical and social aspects of the Zapotillo issue. The trio agreed, with the approval of the Governor, on twenty members: six from Los Altos, where the president comes from, two Guadalajara's environmental associations in connection with water, and two foreign members (Spain). The others are the traditional regional chambers of commerce and other local research centers.

The Observatory wants to impose scientific legitimacy and citizen responsibility in the public space. We have seen how it enacted a set of rules, such as information transparency. Such ethical regulation indeed pleases Mexican people, who complain about their elected representatives as well as poor law implementation in water management. A state official later said that some of the rules were being applied, but the Observatory quickly accused the Governor of not applying binding resolutions and gets into dissent. Chambers of commerce[5], in favor of the dam with full water transfer to León according to the idea that the river has enough water and that the presidential resolution must be applied, become a minority. Instead of leaving the Observatory, they continue to attend meetings. It is not unlikely that such attendance to meetings might have been requested by the Governor to legitimize his Observatory. The Chambers may also care for a socially responsible image.

Between 2014 and 2017, the Observatory has, therefore, consolidated the opposition to the dam as an ally of the historic coalition, which is absent from the Observatory. The Observatory has never been a forum for debate. The director of water agency in Jalisco has never been invited. Was this radicalization predictable? Was it written in the local or national governance? If the president of the Observatory is honored by an official designation, he wants to act for the common good and is wary of politics. His distrust agrees to the two academic members, one being close to the university president, and other campaigning against dams. The same distrust prevails in his region (Los Altos), marked by individualistic and anti-state values. Also, San Gaspar village, despite its success against the San Nicolas dam, has never helped the Zapotillo battle. Similarly, the solidarity of municipal authorities in connection with the village that should be flooded was uneven and often distant.

5 For those who have accepted an interview.

Correspondingly, the members of the Observatory are wary of a president chosen by the Governor. The Observatory president's strategy is likely to provide legitimacy to the observatory while consolidating his own networks. The strategy to unite the Observatory is, however, tricky because his networks in Los Altos are not necessarily willing to defend the sacrificed village. The trio formed by the president of the observatory and the two academic members agrees on the thesis that the village can be secured, on one hand, because there is not enough water in the river for León and, secondly, owing to the option of water demand management, that is to say with water saving in Guadalajara, which they suppose to have never been seriously taken into account by authorities (which supposedly prefer supply management). In other words, common engagement and shared distrust towards institutions connect the trio, who builds a narrative based on the miscalculation of water availability by the federal government. Doing so, the president of the Observatory protects both the village from flooding and the interests of his territory by refusing water transfer to León. This social option leads to avoid publicity on the government project and, consequently, debate not to undermine the oppositions' technical claims with fragile and unquantified arguments. The internal alliance between universities and Los Altos has never allowed considering the observatory as an open forum. The heavy-handed strategy succeeded in consolidating leadership. However, unlike an engineer, he denounces studies carried out by Conagua on the river water availability. Unlike an entrepreneur, the president of the Observatory distances himself from regional chambers of commerce and industry. Opting for the regionalization of water and the refusal of the flood marks his independence from the authorities.

The president of the observatory opts for a broader opposition. By favoring territorial and religious sympathies, he sacrifices the notion of citizenship's debate to citizenship's engagement – a strategy facilitated by the atmosphere of denigration of the State and federal governments accused of authoritarianism or collusion with business. The legitimacy of science in Mexico, despite the activist commitment of academics, remains high in the public opinion and higher when supported by international figures. It is easier for the President to accommodate scientific arguments against the dam with environmental humanism. In the opponents' narrative, León's needs are minimized and even denied according the idea that any transfer of water between watersheds is harmful, as asserted by the international member of the Observatory Pedro Arrojo (who created the worldwide-known New Water Culture Foundation). Apart from the Chambers of Commerce, the President was able to build an agreement within the Observatory despite of differences in point of views, as we will examine later in this work.

The state-based regionalization of water sustains the Observatory's make-believe of unity and citizenship, which partly serves the Governor's strategy. Before 2000 in another State, the Governor Vicente Fox sought to territorialize water for farmers before being elected president: A State law was born. For Fox, attacking

the federation on water management was a successful political strategy while the same territorialization in Jalisco is deemed to failure when the President and the Governor belong to the same party. Similarly, the Observatory was deemed to failure as a citizen forum. On one hand, distrust towards authorities led to issue principles, but impatience to apply them pushed the Observatory aside from the Governor; on the other hand, the universities' opposition to the dam undermined any alternative. Indeed, their experience of manipulation by a prior governor during the public consultation for the Arcediano dam project was painful. As a result, the three options of the President were distorted by an overhanging political game:

i. Loyalty to the Governor would have ruled the university leaders out, while their legitimacy and political weight are substantial.
ii. Voice through debate would have been risky due to the opponents' unquantified arguments for water savings in the city, and no need for water in León. A controversy would have risen between local and national universities.
iii. The fight against the Governor prevailed, although the latter has not yet expressed his views.

In the Mexican context, the strategy leeway of the Observatory's President was zero, except to delegitimize the Observatory. If the convergence with the historic coalition was poorly predictable, it can be explained *ex post* by the will for reconciliation as well as the historical background of mistrust. Distrust against institutions is such that the path followed by the President was the less dangerous for him and for the Observatory. As a result, resentment radicalized opposition. At the same time, local civil society is difficult to expand beyond the universities and remains subservient to international networks. Indeed, population distrusts institutions but highly desires institutional order, which was not the strategy of the Observatory. In a regional town, social participation could not be effective while it was the initial purpose of the Observatory. Paradoxically, civil society engaged against the dam preferred power relationship to participation, just like river basin agencies in administration hands (Vargas et al., 2005). In a context of radical oppositions, identifying coalitions suggests contrasted values, but opportunistic convergence should reveal much more diverse preferences.

The coalitions' dispute

When the Observatory was created. in 2014, an intermediate group, here called "territorial coalition", has been associated to both originated antagonistic alliances: the historic coalition and the government one, which defends the entire project to 105 meters in height and with transfer of water to León. The three coalitions were analyzed through the Advocacy Coalition Framework (Sabatier et al., 1999), which focuses on shared values in the coalitions involved in the

designing of public policies. To facilitate international comparison of the conflict (Bluegrass project), the method has been standardized and then adapted to the Mexican situation, when the Observatory gained media attention in 2015. After a reminding on the method, this section first characterizes the preferred contacts of stakeholders, on which are superimposed, on the relational graph, the most discriminating actors' preferences.

The network analysis

In Zapotillo, the strategy of the opposition to the dam heavily relies on mass communication (Mollard, 2012). Facing the government's rationality, the emotional aspect, morality and causes drawn from international narratives, aim the "public opinion" (Hajer, 1995). An enemy is needed and the opposition targeted entrepreneurial interests hidden behind administrative authoritarianism. The staging permeates stakeholders' values. The opposition to the dam enjoys national and international media coverage, arising from the effectiveness of a few players who kept fighting for more than ten years. The Zapotillo specificity is the Observatory, whose creation aimed to clean up the publicized dispute.

To build the relational graph, the investigation started with the Observatory's twenty members and the historic coalition. Through the "snowball" effect, the feedback of the first surveyed people generated other interviews. We conducted about thirty surveys amongst which twenty-two stakeholders were finally selected. Some Guadalajara researchers have provided vital information without being identified themselves as actors in the controversy. Some stakeholders have been unable or unwilling to accept an interview[6]. An official designated by his head of department has accepted the interview invitation. In any government coalition, personal beliefs are likely to have less importance than in other coalitions, as long as the civil servant does not deviate from official discourse. However, this assumption remains to be proved. Because of the assumption that Officials and Chambers of Commerce defend the government project for the time they will remain in office, we also assume that the investigation's skewness favoring civil society (there are few respondents in the official coalition) does not question the reliability of the method.

In face of the government coalition defending the sole official project, civil society wished to share specific motivations and general causes without anything to hide and massively responded to our call. Every participant, also in the official coalition, sincerely answered questions about his relationships and personal preferences. The respondent was given the possibility not to answer, which was rarely used, except by a local Official who opted for it when addressed with political

6 Two Chambers of Commerce and Industry are not necessarily secretive. The refusal of the investigation may result from an organization that has not defined a position.

issues. Despite these biases, we believe that coalitions, both in relationships and values, were properly understood[7].

The standardized survey, in accordance with the Bluegrass project, aimed to characterize the types, intensity and nature of links between stakeholders in one hand, and, secondly, the values and preferences of each of them. Specific questions related to the Zapotillo dam were added in the investigation: "If the dam was not yet constructed, how high would you fight for? Do you agree with the transfer of water to León?"[8]. In the database, we noted an additional response according to the answer given to the two questions: "Is there a condition set to the two previous answers?". Indeed, the agreement or disagreement with the water transfer can be conditioned by the degree of reliability that stakeholders give to official hydrological measurements.

The database compiled answers to closed-ended questions. The codification of relations leads to establishing the number of players in the controversy to 36 with 22 respondents and 14 non-respondents. The links' base was completed with relationships known as frequent, in particular between non-surveyed government agencies. The codification also standardized some answers. For example, the mention of a link with the "academics" by a stakeholder led us to replace the generic actor "academics" by two links to each of the two university members of the Observatory. The graph was also codified. As an NGO and the village committee were dealt through more than one actor independently surveyed, we graphically brought same organizations' stakeholders together, to turn it into one unique multifaceted protagonist.

The database of preferential links fed a relationship visualization software (values are further processed). The graph positions each player according to preferential relationships with others. Regardless of the type of display selected [9], the software brings stakeholders sharing connections together, and distances those who share less. The stakeholder's position in the graph only depends on the contacts listed for the analyzed controversy. Specifically, these links are known as "preferential" because each actor does not mention his whole contacts. Preferential links are not necessarily shared by each pair of related actors. A cited stakeholder may claim other preferential links, which results in two properties of the relational graph. The first makes it possible to manually move a stakeholder on the graph,

7 At the end of the survey, two feedback sessions were held with researchers from Guadalajara.

8 The answers' codification to the question "if the project had not started (in 2015 the dam work is blocked to 80 meters, much less than the 105 meters originally scheduled), how high would you recommend?", was performed as follows: 0, 60, 80 and 105 m where 0 means no dam, 60 no flooding, 80 representing the current situation with the uncertainty of flooding due to the feasibility of a protection wall.

9 The Force Atlas 2 algorithm of the Gephi software relies on a gravity-like calculation that attracts the most linked nodes (stakeholders).

as the length of the links (the edges) does not directly symbolize a relational intensity. The second implication is that the software considers that the links are directed with incoming ("I am mentioned by a stakeholder") and outgoing links ("I mention a contact"). In fact, the relationship is reciprocal, since one with who I am in contact is necessarily in contact with me. But mentioning preferential links distinguishes the much mentioned actors from those referring to others without themselves being cited. The software does not process inbound and outbound links the same way: the more a person is cited, the more central he is within the relational meaning (the central geometrical position in the middle of the graph is discussed later). Conversely, someone who cites contacts without being cited by others, as a journalist, can be considered as only associated with controversy. The relational non-centrality does not mean that the actor has a marginal position, because the journalist can play a crucial role in the controversy. The associated stakeholder is less involved in the coalitions' structure or its independent action does not require intensive contacts. On the graph, the centrality of a stakeholder is proportional to the size of the node (or stakeholder)[10].

The software computes relational statistics to increase the readability of the graph. Only preferential links are considered notwithstanding the nature of the relationship. Besides the size of the node, color reflects the relational group of the stakeholder. The group is calculated by a modular process that maximizes neighborhood and minimizes indirect relationships.

The controversy graph *(Figure 11.1, Stakeholders' graph, p. 435)* convincingly reflects friendly and enemy coalitions outlined in the historical section. The assertion "those who socialize get together" is satisfied. The continuum (historic coalition to the right of the figure, territorial coalition in middle position and governing coalition to the left) shows structural contrasts with the almost total lack of links between extreme coalitions. The centrality of stakeholders seems reliable for the most mediatized stakeholders. The high density and the relatively large number of central protagonists for a limited number of actors reinforces the idea of a small circle where everyone knows each other. Indeed, the controversy has been lasting for ten years and relational bounce caused by the creation of the Observatory explains the relational structure.

In summary, the graph will test the stakeholders' types of links and preferences, this time in accordance to the saying: "Birds of a feather stick together". Circumspection is already required if we remember that the distance between stakeholders means a group of preferred contacts. The insertion of different types of links or the frequency of exchange does not improve the graph. Of course, the

10 Graph theory differentiates betweenness and centrality to magnify respectively leadership and informational intermediation (Mésangeau, 2014). As Zapotillo refers less to an information network (as in Facebook) than relationshipness, the notion of betweenness was discarded from the analysis.

presence of a conciliation institution (the Observatory) explains the high frequency of contact between coalitions. Critically too, the strategic choices in a fight do not require frequent meetings, as it is the case of financial stakeholders who were never mentioned by any coalition. The only launches of media campaigns, lawsuits won in court, Observatory meetings, etc., explain the relationship structure observed in 2015. At that time, media tactics thus explain many contacts between opponents, while official meetings in the Observatory fed relations with government authorities. Stakeholders' strategies remain in the background.

Findings on relational structure

The network analysis method defines the relational structure of the Zapotillo conflict before adding stakeholders' preferences. The graph of 36 actors and 113 links previously mentioned reveals a substantial relationship density. The average density of 0.09, calculated as the ratio between existing relationships and potential relationships, rises to 0.15 if we consider the non-directional character of these ties[11]. As these two densities are of little significance without referencing a similar case, the visual density of the graph further underscores the many contacts between stakeholders involved in the controversy. If the historic coalition indicates a high density and the one around the Observatory is good (see below), the elongated shape of the graph is explained by less dense relationships between radical coalitions. Although the Observatory is opposed to the Governor, it plays a linking role between coalitions and we will see that, despite its high heterogeneity, the values of the median coalition are intermediate.

The previously examined classification between central and associated stakeholders is completed with their geometric localization on the graph: nuclear in the heart of the graph or peripheral (according to our classification). For example, the three journalists opposed to the dam, but hardly mentioned, are associated actors from the relational standpoint. Their geometrically nuclear stance, owing to contacts with many players in the controversy, distinguishes them to the peripheral actors. A similar nuclear position is held by an Observatory foreign member's surrogate and a former Parliament member involved in the regional defense of water. Although both attend Observatory meetings, no one mentions them, and the only snowball method would have forgotten them. If being associated stakeholders may be fleeting by lesser activity at the time of the investigation, their "nuclear trait" can convert them into full players in other circumstances.

On the other hand, relational centrality and geometric periphery. as it is the case for the Mapder movement[12] and Hijos Ausentes (Absent Children), open

11 The contacts' directivity allows for the calculation of centrality.
12 Mexican Movement of Dam-Affected People and in Defense of Rivers (MAPDER).

the graph analysis to the concepts of borders and scaling. Mapder has not been investigated because the movement only mentions Zapotillo in media campaigns or national gatherings. However, this Movement, frequently referenced, emphasizes the importance for the historic coalition to tune with environmental battles in the country. Hijos Ausentes, which are migrants' clubs acting as fundraisers mainly in the United States, are also in close contact with the historic coalition. A relationally central and geometrically peripheral position turns Mapder and Hijos Ausentes into permanent allies.

Figure 11.2 (Central protagonists' Graph, p. 435) shows the relational structure of the controversy at the time of the survey, based on stakeholders mentioned at least twice. Associated actors appear in the background. The first point is the quantitative significance of the central protagonists who largely outweigh associated actors. This observation refers to the relational density and the idea that the controversy mobilizes a small group of acquaintances. The graph also specifies the historic coalition with two NGOs and the village committee in connection with Mapder and Hijos Ausentes. Although it does not appear evident in Figure 11.2, the special relationship between a university and a NGO is essential to understand how much influent is the historic coalition in the Observatory[13].

On the Observatory side, the leading trio shares tasks. The President is linked to many stakeholders because of institutional position, networks and contacts with the Governor. If the president of the observatory is indispensable, each university is preferentially bound to a coalition. For technical issues, the University of Guadalajara is indirectly in contact with regional politicians via the president of the university. The academic in charge of social affairs at the Observatory is politically committed against the dam because of his links with the historic coalition. Although they attend the same Observatory meetings, the two academics do not mention each other.

Many central stakeholders do not have relationships with government agencies. This is mainly the official duty of the Observatory President. In fact, the complete graph of Figure 11.1 outlined direct relationships between associated actors and the Governor, and local governments through associations, clergy, entrepreneurial chambers, academics and journalists. The territorial coalition and the Observatory complain of not being listened to, but the graph clearly shows various informal relationships. Relational densification due to associated actors would deserve further investigations, in particular on inconspicuous church, academic and entrepreneurial networks, but such studies go far beyond this analysis. Again, the snowball method, if it had started with a few key actors and not from the Observatory, would have failed to highlight informal networks that cite but are not cited.

13 The academic mentioned few contacts, while he is well cited. This discretion is personal and partly due to numerous international and regional contacts: http://waterlat.org/GeneralPDFs/Programa%20VII%20Reunion.pdf.

To summarize, non-surveyed peripheral actors raise the issue of the links between local controversy and other causes, somehow about extending the area of the struggle, which remains to be solved. Indeed, contending the Zapotillo project makes sense when plunged back in the meaning of current social struggles in Mexico. Key stakeholders mostly show four to six memberships in other associations or trade unions and rarely in a political party. This multi-engagement places them in a pole-mediator-position in worlds they can exploit for the Zapotillo cause. These commitments are also thematically multi-positioned because Zapotillo falls within the social justice issue, more than just being an environmental dispute. Local action is part of a global opposition, of which actors exclusively own Zapotillo. Peripheral stakeholders and the multi-engagement of central actors, linking local, national and international levels, suggest a more radical commitment than the only defense of the displaced villagers.

Findings on general values and specific values related to Zapotillo

Governance in Mexico is characterized by distrust towards public authorities (Tronco, 2012), fueled by ubiquitous bureaucratic patronage (unchanged with the multiparty system in 2000), poor official information and weak accountability for Representatives. Conversely, voters are less responsive to a party's ideology than to material benefits and loyalties. Because the concepts of Right and Left feed distrust and because party affiliation has less significance than elsewhere, these concepts are uneasy to characterize. Few (especially within the academics) claim enrolment in a party. There are certainly people with Right or Left preferences, which the Bluegrass methodology assessed with indirect questions.

General values are disappointing in discriminating coalitions. For example, the perceived intensity of the Zapotillo dispute isolates a single peripheral actor, who evaluates it as average when others feel it as strong. Political positioning is more discriminating although heterogeneous. Direct evaluation on a left-right scale is not reliable. Bluegrass organized questions on priority given to economic, environmental or agricultural development. In Zapotillo, agricultural development is not discriminatory, as only three stakeholders reject it. One would think that economic development without priority given to the environment could characterize extremist liberals, but that is not the case. It was necessary to go back to individualities and qualitative interviews[14] to roughly appreciate political positioning and singularities.

A city-dweller favoring economic development and environmental protection, but not agricultural development, may have likened agricultural development to agribusiness. This limited inconsistency emphasizes the range of interpretations of standardized questions. Two actors, who do not likely seem to be Liberals, are

14 The interviews were recorded, except otherwise expressed (one case).

in favor of economic development without making the environment a priority. Also, a university professor justifies himself by pointing out that a researcher must not stick to normative values. Placing the singular stakeholders (in relation to their values) in a special category (IVp, where "p" stands for political values), the classification is organized around categories Ip, IIp and IIIp *(Table 1, below)*. Supporters of economic development and environment are placed in Category IIIp, which concerns the administrations' coalitions and associated stakeholders while it is likely to be the predominant view in Mexico. The IIp class, for the environment but against economic development, roughly corresponds to the historic coalition.

Table 1 - Gross number of stakeholders per political class values ("p" for political stance)

Total: 21	**Priority environment**	**NON-priority environment**
Economic development priority	7 (IIIp)	2 (IVp) (comments in the text)
Economic development NON-priority	7 (IIp)	5 (Ip)

While Table 1 shows the gross size of the political classification, some adjustments are necessary to account singularities. An entrepreneur is identified within the five players who prefer neither the economic development nor the environment (Ip class). This incongruity led us to believe that this network figure reveals the preferences of the group he wants to join. We included him in the IVp class of unclassifiable people. The radical class Ip is rectified to four anti-system people. This qualification is particularly suitable for two of them who also refuse agricultural development.

The values' originality of the four actors IVp suggests individualism in an opportunistic positioning or a positioning poorly stabilized by a group. More generally, the four political classes are ambivalent because of their composition. Political positioning classes do not overlap in the socio-professional category neither in their commitment whether to build the dam or not. In fact, we see that academics and entrepreneurs show inconsistent values with their socioeconomic status. Poorly assertive political values may result from either an actor's values attributed to his group, or on the contrary, from personal assessments of collective issues[15]. Membership in a group or in an institution seems to prevail for some. For example, an international well-known figure of the village committee recalls his values' evolvement from the fight against the particular Zapotillo dam to the fight against all forms of dam.

15 Within the twenty-two interviewed stakeholders, twenty own at least a Bachelor's degree. Amongst the two who gave up at secondary school, one is an entrepreneur and the other a farmer, both involved in local politics. It is therefore not a lack of understanding of the issues. In addition, the consistency of the three questions and the lack of concerns about their meaning do not suggest any ill-worded questions.

The political positioning distinguishes neither right nor left except what may be called "Left anti-systems". The class defending economic development and environmental protection brings stakeholders together from all coalitions (Figure 11.3). Specific questions to the dam are more coherent and convincing. We will also see the approximate relationship between political positioning and posture in relation to the dam. As for the sociological profile, nothing appears, except the mentioned inconsistencies: entrepreneurs against economic development, academics non-committed in the environment despite their practices, etc.

Figure 11.3 (Actor's political positioning by classes, p. 436) also highlights the political positioning of central stakeholders (large node) and allies (small nodes). Allies' values are very variable. Allies are more individuals than group representatives. Central actors have a more uniform profile in the historic coalition (right side in figure 11.3), with some anti-system ones. It is more difficult to decide for the government coalition (left side of Figure 11.3). Presumably, the advocates of the official project in non-surveyed Chambers align politically with those, surveyed, with a neoliberal stance. About agencies, fairness prevails over ideology, so that it is difficult to characterize values and preferences. Finally, territorial coalition seems to be more politically heterogeneous. The president of the Observatory, although an engineer and entrepreneur, criticizes the government project. He embraced the historic coalition's values to reconcile a broader territorial alliance. The enlargement strategy could explain the unpredictable alliance of territorial coalition with the historic coalition.

The same type of classification used for table 1 on political positioning leads to the identification of a range of stances from the refusal of any development in any condition, to average dams (up to 80 meters), with water transfer to León conditioned to the availability of water in the river. These stances are all opposed to the government project based on the 105 meters dam, water transfer and village displacement *(Table 2, below)*.

Table 2 - Classification of actors by their stance on the dam ("d" for dam)

Flooded villages Criteria	Other criteria	Number	Class
Against flooding	0 Dam, 0 transfer, unconditional	3	Id
	Small dams, 0 transfer, unconditional	2	
	0 Dam but conditional transfer	9	IId
	Small to average dams, but conditional transfer	6	IIId
For flooding	Complete dam and transfer	2	IVd
Total		22	

As we noted singularities in the political stances, the three answers to questions about the dam are not free from inconsistencies. For example, two IId protagonists

position themselves against all forms of dam but defend the transfer, because they say that it all depends on water availability. Four players displayed an ambiguous posture against flooding. It is true that the issue of the protection wall is under debate: officially stated in the 80 meters project, it was later denounced by the same administration while an international expert suggested that it could be possible[16]. The only fault line split the extreme groups. In the intermediate positions, is there confusion in expertise? Or a lack of technical information? Or willingness to join a leader whose words were poorly interpreted? Or an individualist position that ignores the technical data and is not interested in others' opinions? It is difficult to answer considering such a patchwork.

If the number of technical options is substantial, the variety of values shows the lack of both unity and coordination within coalitions. The panorama of values becomes subtle with conditionality, which refers to sufficient water to be transferred to León. Thus, 16 opponents to the transfer and 6 acceptances reverse, if enough water, to 5 cons and 17 pros. That is to say that the conditionality criterion tilts refusal to approval for water transfer. It breaches within the opposition while, at the same time, conditionality ensures its apparent unity. Conditionality unites opponents to the dam around the idea that Mexican institutions responsible for hydrological measurements are not reliable.

In this context of both structured and heterogeneous values, two minimum criteria unify the opposition. The first is the refusal of flooded village, a criterion that explains the preference given to human rights in the alliance between the historical and territorial coalitions. The environmental cause is marginalized because it does not coalesce opposition enough. The second criterion is the conditionality of the transfer which, because it is muted, guarantees the two opposition coalitions' unity.

Options for the dam are not uniform within coalitions *(Cf. Figure 11.4: Synthetic stance on the dam, p. 436)*. As seen before, radical coalitions have opposite choices according to two ideologies: full-technology and confidence in institutions for the government coalition and full denial of dams for a part of the historic coalition. Both individualism and lack of coordination disturb the panorama for various reasons. First, the coalition government is not completely coherent when the Governor, unlike his water administration, did not comment officially, when the mayors of the Guadalajara metropolitan area recently politicized the dam, and when two Chambers of Commerce did not express their views. Such axiological uncertainties constitute a limit to the *Advocacy Coalition Framework* method. The historic coalition unity is clearer even if the village committee defends more radical postures. Journalists and blogger allies seem less in line with options put forward by the historic coalition. Finally, the territorial coalition's attitude

16 The ten-meter high protection wall would lock the village within a closed valley conducive to flooding during a very rainy period.

shows heterogeneity or ambiguity. Common minimum values link the coalition, gathered in opposition to the government's vision. The axiological opposition of territorial coalition is fragile, but this weakness is secondary for leaders looking to take advantage of the media opportunity offered by the Observatory to build their regional legitimacy.

Political positioning and views on the dam

The relationship between political positioning and stance on the dam confirms analytical difficulties because of numerous combinations. Only few radical stakeholders show coherence between political positioning and values on the dam project.

Table 3 - Number of actors according to political positioning and views on the dam

Total: 21	**Political positioning**				
		Ip Environment and non-priority economy	IIp Environmental priority, non-priority economy	IIIp Environment and economy priority	IVp Non-priority environment, priority economy
Positioning on the dam	Id 0 or small dams, 0 transfer, unconditional	2	1	1	1
	IId 0 dam, conditional transfer	1	3	2	2
	IIId Small to average dams, conditional transfer	1	4	1	0
	IVd Complete dam and transfer	0	0	2	0

Table 3 cannot be diagonally structured for a lack of statistically significant combinations. Even reducing the number of classes by unifying similar options, it fails to reveal a trend. The choice of a particular posture thus reveals factors that, according to the metrics used, produce a virtually random pairing. Besides the anti-system positions in one hand and the governmental view in the other, the existence of numerous axiological combinations deserves attention.

As said above, opponents are *conditionally* against village flooding and water transfer. Reliable data to be provided by UNOPS could break the unity of the

opposition, unless new doubts would be raised. Opposition's agreement arises from the shared mistrust regarding Conagua studies. Distrust toward authorities partly explains the large number of controversies in the country through many types of commitments against unconvincing institutions. Even though they are small in number, opponents can rely on popular distrust to propose poorly substantiated technical alternatives such as the unproven possibility of water management by demand or "León does not need water".

In this fragile union, two types of commitment are able to explain the combination of postures in opposition to the dam. The first is a "hard"[17] ideological dedication. Even without being anti-system, and with the possibility "water for everyone" left open, the "radical" stakeholders physically devote time and energy to the fight. They then congregate second-level activists, with hard or soft ideology. Soft opponents are attracted by the pure cause of social justice and environment with varying political beliefs, or even a certain apolitical innocence. However, their contact with "ideologists" can strengthen commitment, or, otherwise, make it temporary. This dual level of commitment would also explain the difficulty of coordinating, within civil society, conflicting purity postures and combat ideology.

Finally, the heterogeneous opposition to the dam also feeds opportunism for the territorial coalition. The president of the Observatory relies on a few leaders in the region of Altos, who are personally or politically committed in territorial development. We can say that this micro-network is makeshift mounted with large farmers, lawyers, a priest and local entrepreneurs. Beyond the political and environmental stances of each, it is possible that the only goal to strengthen regional identity brings a heterogeneous micro-network together.

The formation of coalitions: an interpretive essay

From values to coalitions

Modularity has statistically formalized an approximate model of preferred links *(Figure 11.1, p. 435)*. Links between central protagonists have emphasized the historical coalition *(Figure 11.2, p. 435)*. Do general political and particular dam values specify coalitions? Yes, in the extent that it becomes possible to axiologically hang a peripheral stakeholder to any coalition (this is less true for the strategic plan).

Regarding the political positioning, values distinguish radical coalitions, namely two belief systems: In the historic coalition, the anti-system ideology ensures the permanence of commitments, which leaves one academic and the Observatory

17 The lack of correspondence between hard ideological commitment and conditionality for water transfer to León underlines the non-traditional nature (Marxist-based struggles for example) of the dam opposition.

President out of this coalition. For the Observatory President, village-focused humanism (although dam values reveal ambiguity in his group) and territorial opportunism explain the tactical rapprochement with the historic coalition. Due to value heterogeneity within the territorial coalition, such alliance seems to receive minimal support from rural associations. The changeover was therefore unpredictable for the Governor when he created the Observatory. As for the Academic, the support of the university which he is the president's representative with his own axiological positioning, suggests a political commitment more than the humanist one. In previous dam disputes, the public university indeed has been adopting a stance according to internal tensions between the Faculty of Engineering vs. Ecology and Social Sciences Faculties. When we associate the political role of the whole university with the axiological data of the University's representative, we conclude that the University must be set aside from the historic coalition (*Figure 11.5, Synthetic Graph coalition, p. 437)*.

If general values specify coalitions only at the margin, it also applies for specific dam values. As we previously stated, radical coalitions are axiologically opposed. The dam preferences only allow incorporating or excluding a stakeholder from a coalition on the axiological basis. Thus, the second Academic is fully integrated in the historic coalition. This well-cited protagonist, who doesn't cite much, secures the historic coalition's presence in the Observatory. For the village committee whose two members display a radical commitment, centrality and values are compatible with the historic coalition. Only conditionality of enough water splits them, meanwhile unrevealed conditionality guarantees the unity of opposition. The village committee also embodies pure and uncompromising commitment, when the historic coalition leaves the possibility of negotiations opened, in case of water availability. Central stakeholders of the historic coalition, connected for years[18], are also closely related to two key peripheral stakeholders: Mapder and Hijos Ausentes. Finally, poorly mentioned allies (by definition) are part of the historical movement by sharing some values on the dam or through joint actions in the past.

As seen before, the government coalition is not monolithic. But the Governor's actions (his tweet, the Observatory creation) reveal a strategy, even if he has not spoken out about the matter. Under his control, the State water commission fully supports the Government project. Even the Environmental Secretary of Jalisco, Semadet[19], is likely to join the Government coalition. But, in charge of Environment, he has some independence. Indeed, the governor must display some pluralism concerning the dam because he would rely on Semadet in case of winning

18 We did not mention the relationship between the village committee and the village. The subject is complex, since it is part of the unspoken. Virulent opposition, departures from the village and some family support have built the village committee represented by older women. The rest of the village is now less in opposition than in the wait-and-see, even with some sympathy with the committee.

19 Secretaría de Medio Ambiente y Desarrollo Territorial de Jalisco.

dam opposition. Thus, Semadet Officials discretely mentioned environmental justice values stronger than the official version.

Let's not forget the Altos' territorial coalition, whose axiological heterogeneity deserves an explanation. We discussed a "makeshift micro-network" opportunely using the Observatory to assert a territorial identity that is still limited (see above). The coalition acts more by common actions of this development-oriented local network than by political values and preferences on the dam. The strategy here is based on interests and friendships that give a leader power by supporting him, and occasionally controlling him. Trust, in connection with long relationship or stakeholders' fame binds the territorial coalition. Like the uncertain relationship between the village committee and the village, this abusive coalition taking advantage of a conflict leads to the questioning about the affected area in the conflict: Los Altos or Jalisco?

The territorial coalition seems to unite the agro-industrial region (Los Altos) where the dam is built and the entire state of Jalisco[20]. In fact, a few political leaders from Los Altos and the Governor have used each other to defend their own interests in a temporarily convergent strategy. Thus, the Governor's goal to create an opposition to water transfer in his state with the Observatory creation met the specific objectives of Los Altos' leaders, even though they represent themselves more than their region, as they have not been elected. In other words, association leaders build the dam and transfer deal less to unify Jalisco than to strengthen the identity of Los Altos. They take advantage of the Observatory to publicize discomfort in a region poorly recognized by authorities. This is less about bargaining water of the river than capitalizing on the difficulties faced by local farmers, cities and entrepreneurs. Blunders have indeed fueled discontent when the federal agency wanted to regulate water titles and uses. We could, therefore, expect the territorial coalition, more based on a leader's charisma than shared values, to have difficulties representing Jalisco.

Costs and benefits of the network analysis

For a limited controversy such as Zapotillo, the network analysis has a low-cost implementation. The survey describes the type of preferred relationships of each stakeholder and his preferences. Statistical and graphical analyses are easy to manage. The visualization quantifies when the socio-political analysis is mainly qualitative. However, its scientific nature, facilitating scientific communication, can be counterproductive if quantification is not based on a solid analysis of controversy.

20 While opponents believe the Zapotillo dam will affect the use of water in Los Altos, an expertise shows that this is not the case. http://www.milenio.com/region/trasvase_leon-acueducto_zapotillo_leon-conagua-milenio_noticias_0_928707167.html.

The network analysis is in no way an alternative to the socio-political analysis, and it summarizes nothing in the controversy.

The contributions of the network analysis concern unexpected information and the consolidation of socio-political results. First, it materializes the controversy's elitism. The relatively high density of links among stakeholders and coalitions[21] is the result of eleven years of conflict and a small number of actors who know each other. The new actors of the territorial coalition and new replaced officials rapidly acknowledge people at the Observatory. Also knowing that most actors live close to Guadalajara and are educated people, it is not unusual that more than half of relationships (65 out of 113) are beyond the mere formal contact[22].

The systematization of the investigation from the Observatory highlighted the allies who, if they are not central in a relational point of view, achieve a connection with informal networks. A world of inter-acquaintance facilitates relationships, including with the Governor and the urban integration of non-urban stakeholders (village committees and Los Altos associations). Each stakeholder has a direct access (or easy if indirect) to others. The connections operate by institutional or informal networks around business, Catholic Church or universities. Moreover, the Observatory connects secular and Jesuit universities' networks.

The relational analysis cannot ignore political and cultural context. But, if it is difficult to document a supposed emotional aspect, we may evoke socio-political factors. In general, relational easiness refers to a common cultural package gained in universities (engineers, entrepreneurs, lawyers, journalists, etc.). While the epistemic community is cleaved between opponents and advocates, it eases mutual understanding and the ability to access each other. In addition, multi-positioned elites not only build a commitment and a common language, but also a responsibility. As spokespeople for nonviolent causes, stakeholders contribute to pacify the controversy for the Zapotillo, which never led to hate even if some suffered pressure from authorities[23].

In Mexico, the politico-cultural aspect also refers to the desire to join a group and to loyalty, which may explain certain stances. Some aspects have been previously noted about the gap between socio-professional category and defended values (as an entrepreneur who discursively favors a non-economic logic), or by the technical narrative favored by stakeholders. The narrative of the opposition is based on technical alternatives to the dam, such as the preference given to water demand

21 Subtracting the Observatory's contribution to relational density, link density only decreases from 0.090 to 0.076.

22 Result similarly found in the north of Mexico (Navarro-Navarro et al., 2017).

23 According to Global Witness https://www.globalwitness.org/en/campaigns/environmental-activists/dangerous-ground/ Mexico is presently less affected by killings of land and environmental defenders than in other countries (and much less relatively to the high level of homicides in the country). However, violence recently plagued various social struggles.

management, and the story that León would only need water for its industry. As few data support these claims, their acceptance is due to the confidence in the group. Long-standing confidence within the historic coalition in spite of no expansion and new actors for many years is likely to also mirror loyalty in engagement and exclusive leadership in multi-engagement.

Exacerbated confidence in a group may additionally compensate distrust towards authorities. Distrust is actually the other side of the politico-cultural configuration. In this study, political partisanship has not shown any ability to anticipate stakeholder's engagement in defense or opposition to the dam. Political parties mainly serve as a foil, due to the "cultural" institutional distrust (Buendia & Laredo, 2017). Curiously, the academic elite, committed to democratic ideal, displayed some political innocence, facing tactics from authorities and stakeholders.

The political and cultural dimensions finally concern the depoliticized radicalism. Interlacing commitments (Mésangeau, 2014), long commitment devoted to the fight, and antisystem positioning contribute to the idea of radical commitment. However, radicalism is depoliticized for two converging reasons: national distrust towards institutions, including political parties, and the international movement that refuses party affiliation as well as any ideological exploitation of environment even though many accuse liberal democracies to be the source of the whole problems.

Sociopolitical reductionism of network analysis

Network analysis' main limitation is to consider the main dispute issue, protagonists, and institutions as basic facts, when those characteristics are won or lost in a game made of power and opportunities. Relational routine that binds or opposes coalitions in a given period is only one step between a past, structural and contingent, in one hand, and an agenda and hidden interests, on the other. In this arena, a minority seeks to make its voice heard by non-institutional means, even by accusing public institutions. The opposition is classically split between those who seek official recognition for their existence and those who refuse it, among which those who want to only influence are less radical than those who wish to change the socio-political economy. As a reduced model, the network analysis reflects the interplay of influences and highlights the difficulty to unify, due to many motivations in coalitions.

Moreover, the graph is a snapshot representing a phase (the one initiated with the Observatory here) and a repertoire of actions (legal actions and media campaigns here). Any external or internal event provokes the involvement of other stakeholders, such as trade unions or political parties modifying accordingly to centralities. The graph barely foresees breaks in the conflict's path. The static image of the relationship does not identify the temporary actors who may be misinformed

and whose values have little meaning. It reveals neither the motivation nor the strategies of long term protagonists. For instance, which strategy is able to explain the repeated media campaigns without media coverage or social mobilization? The network analysis is unable to answer or simply to question this apparent inconsistency. The four media campaigns, though they have almost no local echo, fueled blogs with international repercussions and, consequently, national ones. Such inconsistency is also related to the desire to connect two coalitions, in particular, historical and territorial ones. The impact of the Zapotillo dispute at national level is finally explained by a lack of large profile media controversies, where Zapotillo is then the emblematic national struggle. Permanently producing micro-events is a strategy that keeps the faith of stakeholders on the field. Whatever its nature, micro-events are part of a strategy linked to the dynamics of multi-scaled interactions to keep the conflict alive.

Another limitation is the multi-positioning of stakeholders. We already discussed the memberships of key protagonists to organizations advocating various causes. However, the network analysis is not able to assess the importance of this factor. Indeed, multi-positioning binds causes, scales, and thematic networks. It contributes to the centrality of stakeholders, due to an increased legitimacy of a mediating position and sustained commitment. Links outside the scope of the fight should be investigated to clarify the nature and influence of multi-positioning. But, due to the methodological difficulty in concatenating incompatible sources such as local surveys and Big Data, it is not possible to evaluate the influence of external links on the centrality, motives, and strategies of stakeholders. Other forms of dependence, for example, when a financial player controls a source of funding, contribute to the centrality of an actor but are not mentioned in the network analysis.

Network analysis experiments the theoretical deficit to classify the variety of links. Formalization is in social geometers' hands, who mathematize relational chaining (Bidart et al., 2011)[24]. For Zapotillo, where connections between protagonists are common, whether they are institutional or within the well-organized civil society, nature and types of exchanges have not brought added value to the preferred relations' graph. The importance of personal links was noted. Preferred relationships also defined modular groups, computed by the software (Figure 11.1) close to groups conceived on values and socio-political context (Figure 11.5). Values have mainly elucidated the closeness of a stakeholder with a coalition. Against the saying "birds of a feather stick together", sociological profiles and values within the elite are surprisingly varied.

Finally, appealing graphs and their easy way to be produced are counterproductive for knowledge without a socio-political analysis. For Zapotillo,

24 Confusion sometimes occurs in geometrical theories of networks between informational chaining and collective action links (Kondratov, 2016).

the added-value of network analysis is weak compared to socio-political analysis. The reliable socio-political analysis remains to be defined.

The socio-political approach

The socio-political analysis (Lorrain & Poupeau, 2014; Mollard, 2012) must consider all stakeholders and not just opponents or key protagonists. It should symmetrically identify sources of legitimacy that are exploited in current repertoires. Among these legitimacies, expertise is a source of power for the actor who controls the uncertainty of technical controversy. As a result, the observer should exercise a critical approach to the socially built legitimacy. It is not about who is right or wrong between legitimacy with unequal strength, but about identifying the source of the belief, the confidence in the group, and the impact on a more or less sensitized public opinion. A critical observation must rely on transdisciplinary science to deal with technical, political and social challenges (Chateauraynaud et al., 1999; Forsyth, 2003). Through the controversy, the observer questions even other researchers' interpretations that target a culprit without examining the socio-political system made of minorities, narrations, action repertoires, struggles, and power balances. In the socio-political system, the analysis must assess the leeway of actors. Non-exhaustively listed, these different points witness the difficulty of the method meanwhile they illuminate the philosophy of such a research.

Governance (or sociopolitical system) explains the controversy while the controversy materializes governance on a sectoral basis. Logically, the case study is insufficient to identify general mechanisms that build appearances up, and to characterize powers a type of governance makes them possible. It should be supplemented by comparisons within the same governance and between governances, making the socio-political analysis stronger, but also longer to produce.

Every era has grand narratives first relayed by mediators and social leaders. These discursive resources are means of influence for a minority or a majority. The stories' origin and the way they are built help to identify the mechanisms of their universalization and to appreciate the cross legitimacy produced between the international sphere, where they are originated, and local actions that mobilize them. This multi-scale methodological device illuminates the "rise in generality", by which local actors mobilize general narratives to hide local interests and build unity like in the Zapotillo case. Hence, the rise in generality emphasizes the duality of the term "values" when actors with special interests take on a general cause. The *Advocacy Coalition Framework* theory, based on declared values as a means to identify parliamentary coalitions, does not identify the axiological opportunism of stakeholders. It's a proxy, which describes the temporary status of an alliance. By no means it permits reading strategies and shifts. A fight today on environment protection will tomorrow defend architectural heritage and later human rights,

public health, and sustainable agriculture. Adaptive causes reflect opportunism and commitments, which can be deciphered by a comparative, historical socio-political methodology. Interwoven or interchangeable causes are organically linked to the multi-positioning of key protagonists. A local controversy is not only aid granted to a minority, and a Controversy on environment is not only about fighting for a cause. Because it is selected within a period-specific repertoire, the cause is comprehensible by everybody. Building a public-spirited legitimacy and targeting an enemy improve the readability of the cause. A controversy deals less with conflicting interests than a nested narrative system ranging from actor's values to ideological causes including period-specific narrative and repertoire.

A value is a construction that hides as much as it reveals. Its characterization refers to the intentions of the speaker as well as the socio-political system that provides meaning and legitimacy. The concept of value faces methodological and conceptual difficulties not yet resolved[25]. The construction of audible speech leads to question discursive shifts required for legitimacy needs (Elster, 1998). The more it is audible, the more the observer must examine the values of the period. In Mexico, many values are related to a "culture" resulting from distrust towards authorities, with a possible over-investment in interpersonal relationships. The cost of the socio-political analysis of a governance-embedded controversy is high, especially for specialized disciplines deprived with tools to go beyond appearances. This cost may encourage an observer to focus on easy quantification and attractive graphs, such as network analysis.

Conclusion

Just like in many conflicts, the Zapotillo dispute is marked by ten years of cumulative contingencies: stakeholders, causes, scalable framework, alliances, personalities, opportunities, etc. The network analysis gives a simplified representation of a specific stage when the socio-political analysis provides structural elements. Even worse, the network analysis reports tactics without contributing to find strategies out. Lessons to be drawn from quantitative methodology are then limited. Basically, the heuristic contribution of network analysis for the Zapotillo conflict in 2015 is reduced compared to the socio-political analysis.

In one hand, relational density and personalized relationships opened the political questioning to the cultural dimension, more as questions than as results. On the other, the small number of actors involved, whether it allows for a personalized approach, makes it difficult to generalize. The socio-professional categories are

25 Ingleheart (1990) does not distinguish the effect of socio-political governance in cultural construction of values.

little explicative while the political values that only distinguish radical coalitions. Due to the international comparative vocation of the survey, the standardized values approach did not overcome major ambiguities. The dilemma between standardization to compare, and adaptation to understand, remains a problem to be solved in the comparative approach, where culture and politics are insufficiently conceptualized. In addition, the wide variety of links is problematic due to the difficulty in summarizing their meaning, which seems to be poorly relevant in the Zapotillo case. The only preferential contacts have provided a convincing graph. Relational graphs would be promising if we could concatenate scales, include multi-positioning and identify coalitions in multiple networks and trans-scales. Partnership with Information Technology specialists is essential. Let's remember that strategic actors are absent from preferential links, such as some financial donors of civil society. Last but not least, the Observatory, more than the network analysis with the snowball method, was a chance to incorporate stakeholders associated to coalitions. Their non-centrality is only apparent, since they make various network gateways apparent (church, business, university, journalists).

The theoretical Advocacy Coalition Framework is formal or positivist about interests and values. If shared values within a Parliament are an indicator of law acceptance, are they a prerequisite for the establishment of a law? Does the Advocacy Coalition Framework invite us to go beyond the trivial nature of plausibility to incite addressing time-framed strategies, multiple constraints or multi-engagement? Finally, has not the Advocacy Coalition Framework been formalized for parliamentary action where political parties publicly express politically-correct values? Societal controversy is different since the political values are doubly hidden, especially in the global South: distrust towards institutions and political parties; apparently depoliticized civil society. As seen in this chapter, expressed values are opportunistic, interchangeable, and conditional, conditionality supporting a coalition and hiding real values. The absence of publicly expressed values has a high political significance, as shown by the Governor who has never revealed his strategy.

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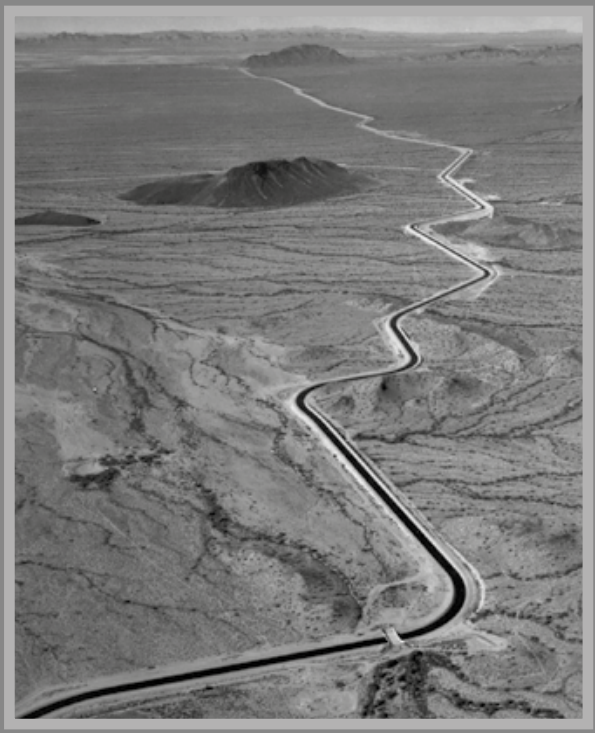


The Central Arizona Project (CAP).

THE ECOLOGIZATION OF WATER MANAGEMENT

The Editors

In most cases it is difficult, at the end of the financing process of a collective research project, to present definitive results. Of course, one should take into account the time required for research to be conducted, and the time required to deliver it, which exceeds the period pre-programmed by scientific administrations, even if those administrations are able to extend deadlines. There are also, especially in our case, the intrinsic difficulties associated with an unusual international comparative project in which the analysis this work studies, all of them adapted to a shared analytical grid, and the appropriation of other, internal terrains by participants in the project, provide the basis of a collective work focusing on the gradual construction of the object of study and the production of results. It is, therefore, less a question of publishing the initial results of comparisons between case studies and highlighting the specific contributions of the methodology proposed, which mirrors a desire not to limit the research to a series of monographic studies, and more a question of incorporating those comparisons into a process designed to develop a model of comparative intelligibility. Beyond the initial subject of conflicts about water, it is, therefore, useful to review the hypotheses and expectations underlying the research project itself.

Initially, the Bluegrass project had three objectives. The first was to *re--position conflicts about access to water within the framework of processes that go beyond territories of problems and struggles with a view to reconstituting the social, political and institutional logics underlying them.* On the one hand, the methodology applied in the project consisted in reintegrated stakeholders into the systems of social disequilibria characteristic of specific societies by identifying their personal resources (notably, their education and professional trajectories); on the

other, the intention was to take into account the multi-level nature characterizing contemporary public action.

Therefore, the second objective was to *understand these conflicts not only in the context of contemporary realignments of public action, characterized by an increasing amount and an increasing diversity of protagonists in the sector, but also in the context of the "ecological transition"*, which is of particular interest to policy decision-makers and researchers, because there have been many observed failures to implement global environmental policies. The ecological transition is a process that involves a growing influence on the part of advocates of the green cause, or, in other words, "ecologized" protagonists of water, and is exemplified, on the one hand, by the territorialization of hydric policies and, on the other, by the internationalization of environmental norms and management models. These realignments led to take into account mechanisms such as the changes of scale in public action (metropolitanization; inter-commune structures; sectorial zoning like watersheds, etc.) and the imbrication of different levels of action (communal, municipal, regional, national, international).

To meet these two initial objectives, the coalition-based approach presents a heuristic advantage in that it focuses on systems of relations between the various components of public action. In effect, the Advocacy Coalition Framework (ACF) has the merit of being theoretically based on an approach to political decision-making that concentrates on the realignments of protagonists from "all parts of the policy process" (Hill, 2009: 62), the practices and relations of which diverge from exclusively organizational concerns. On the one hand, the preference of members of coalitions is more closely linked to causes advocated by their coalition than to those of the institution to which they belong. What really holds coalitions together is their "glue", or, in other words, shared beliefs within them (Zafonte, Sabatier, 1998; Weible, Sabatier, McQueen, 2009). On the other hand, interactions, most of them informal, within coalitions, are more decisive for their members than those, most of them formal and hierarchical occurring within their original organizations. Methodologically speaking, the ACF approach examines these social spaces (coalitions) from the perspective of the individuals composing them (Sabatier, Jenking-Smith, 1993) and not from that of the organizations to which they belong. However, this approach cannot be described as "a-organizational". Organizations feature in the analysis as one of the resources of a member or a coalition. The objective of the Bluegrass project was to incorporate a multi-level perspective into the modelization. "All parts of the policy process" also means that all levels of action can be represented in a coalition. In this perspective, the multi-level approach has three meanings: the various levels of action, each with its own skills (planning, funding, etc.) and the rules governing them; the relations (formal and informal) between those levels; and the phenomena of changing scales (the emergence of levels of action in function of the issues at play, such as, for example, inter-municipality).

The third objective was of a theoretico-methodological order. *While analyzing advocacy coalitions, an approach was realized which has the advantage of incorporating conflicts and the development of public policies into a single analytical framework. The Bluegrass project simultaneously attempted to integrate variables often ignored by the mainstream theories in this current,* particularly the ACF. First, the aim of the Bluegrass project was to take into account resources deriving from membership of a specific network. While approaches to public policy networks have often taken this dimension into account, the standard approach to advocacy coalitions differs to the extent that it insists to a greater degree on the way in which common beliefs are gradually shared by all protagonists in the water sector, thus providing a basis for the formation of coalitions (Sabatier, Jenkins, 1993). But other researchers have highlighted additional factors, for example the impact of the structure of the network (Ingold, 2001; Matti, Sandström, 2011) and the perception of the influence of the principal protagonists (Weible, 2005; Henry, 2011), henceforth referred to as "network resources". Then, in terms of decisive factors in the realignment of coalitions in conflicts and in the development of water policy, another hypothesis has been tested, namely that, *in addition to shared beliefs and resources rendered accessible by their position within the network, the career paths of academics, professionals and militants in the water sector play a decisive role in the development of coalitions.* To build a bridge with existing literature on public policy coalitions, which focuses on *shared beliefs (B)* and *network resources (N)*, we decided to refer to this new variable as *personal resources (P).*

Lastly, the Bluegrass project focused on the more general problem of the *links between conflicts and public policies*. Conflicts, here, mean protests associated with access to water (essentially in terms of water quality, infrastructure, and the service itself), their consequences in terms of pollution and public health, the management of points of vulnerability (drought, floods), and solutions provided, or not, such as public policy measures (service, investments, etc.) *(Table 1, p. 363)*. But the research did not stop there. Conflicts are often bureaucratic, involving administrative sectors at various levels of management. From a methodological point of view, the project collected detailed information, quantitative and qualitative data, on the type of conflicts observed. However, it placed less of an emphasis on understanding the process of causality linking those conflicts to the content of public policies. Due to the lack of a methodology adapted to this type of question, the results announced at the end of the conclusion have no more than a hypothetical status.

First of all, this conclusion focuses on the approach, based on dissatisfaction with the way in which conflicts about water are addressed in the existing literature, taken to a methodology designed to provide an innovative perspective on those conflicts by adapting the ACF and applying a shared analytical grid. The methodology was used to develop a comparison between research terrains,

applying a cross-sectional analysis of three variables, namely the cognitive glue holding coalitions together; resources associated with the network; and the personal resources of the actors. The scientific contribution made by the Bluegrass project concerns the composition of coalitions in water conflicts, the links between coalitions and conflicts, the elaboration of scenarios explaining the structure of coalitions encountered in various terrains covered by the project, and the definition of variables making it possible to understand why, in certain contexts, some coalitions are dominant. Lastly, this conclusion develops an interpretation of the influence of these variables in regard to two specific issues: the relatively contested emergence of ecological concerns within conflicts and public policy, and the "greening" of the coalitions involved in water conflicts resulting in the development of public policies. In effect, one of the major results of the project is that, although conflicts and coalitions have undergone a process of "ecologization", ecological issues emerge in different ways depending on the structure of coalitions and the relations between them, and in ways that vary depending on specific institutional, political and social contexts. In regard to the various levels of action studied, the project reveals the need for a study of water bureaucracies (Molle et al., 2009), and the fact that it is not enough to rely on monographs about conflicts. Instead, it is important to take into account the institutional and social dimensions of conflicts about water, and the impact of those dimensions on public water policies.

From conflicts about water to the comparative analysis of coalitions

A flexible, adaptable analytical grid meeting the needs of comparative analysis

The descriptions of conflicts about water presented in this book cover a wide variety of situations, including processes of urban growth and climate change affecting water supply. They are rooted in the *contentious* (Tillly, Tarrow, 2015) and a revolt against situations that are often linked: the lack or poor quality of the service, shortages in terms of supply, protests against inequalities in access to water, and the rejection of new infrastructure (dams, transfers from one region to another, etc.). They are also inscribed in a desire to promote new instruments of water policy, be they more collective regulatory instruments (commissions, planning, etc.) or measures aimed at better conserving and re-using water resources (processing and/or recycling waste water, localized reservoirs, etc.). Conflicts take different forms, ranging from extremely polarized situations (often known as "water wars") to more institutionalized struggles, or struggles euphemized by discursive consensus about undiscussed and undiscussable objectives, opening the

door to political compromises involving the development of a balance between economic and ecological concerns.

Based on an analysis of coalitions, the analytical grid applied to the case studies developed in the project was flexible enough to be adapted to the specificities of all the terrains studied. Thanks to a network analysis, the analytical grid helped to reveal a certain number of similarities, and, on occasion, regularities. In this sense, conflicts were only a point of departure for understanding the social and political configurations providing the framework for them. The project's approach was divided into five phases: isolating conflicts concerning issues of access to water; describing the system of social agents mobilized not only by the conflict in question but also by the issue of how it should be addressed by public policy measures; collecting data to be incorporated into an analytical grid based on the new approach to coalitions; processing data; and, lastly, comparing the realignment of networks/coalitions (a comparison attempted in this conclusion). The project's comparative approach enabled to broaden the common vision of water conflicts from local protests against the state government to an appreciation of the policy process, encompassing water bureaucracies and the expertise of the hydraulic engineers employed by them, as well as the internal interactions and resources of coalitions. The high resolution provided by this methodology for observing advocacy coalitions makes it possible to take into account a wide variety of protagonists and the interactions between them, and provides a picture that is not (always) based solely on an opposition between social movements and state administrations. Of course, in most cases, the coalitions observed emerge from social movements and the socio-institutional configurations by which they are structured and which, in turn, contribute to transforming them. But they are also inscribed in the administrative spheres in which water and the water service are managed. These spheres enjoy a certain degree of autonomy vis-à-vis struggles over policy and their protagonists (residents' committees, local and national politicians, etc.).

In the case study comparison phase, the configurations of coalitions related to each conflict were initially highlighted. Beyond national differences, the idea was to be able to compare coalitions from the point of view of the institutional, professional, academic and militant characteristics of the individuals involved in them. The survey was then developed along two separate axes; on the one hand, comparing case studies enabled us to analyze the configuration of coalitions and the decisive variables affecting them; on the other hand, it encouraged us to study the multi-level dimension of approaches to managing water, taking into account the spheres of engagement of protagonists in the water sector, as well as their socio-professional characteristics. These results simultaneously make it possible to understand the variables impacting conflicts and the process of formation of coalitions capable of exerting an influence on water policy.

The empirical basis of the classification of coalitions

One of the advantages of the ACF approach is that it encourages an analysis that goes beyond "iron triangles" (governments, administrations, legislators, interest groups, etc.) and takes into account all the other protagonists capable of impacting public policy, including journalists, researchers and experts (Sabatier, 1988: 131). The survey also incorporated various components of social movements (associations, resident committees, etc.), whose contribution to the development of coalitions is significant (Kübler, 2002). Therefore, the protagonists in the water sector were provisionally divided into seven different categories, each of which is capable of forming coalitions on their own, but which, more often, are likely to work with one another during conflicts to create new coalitions. The objective of this "provisional definition" of the object of research, in the Durkheimian sense, was not so much to establish a typology, but to develop, to comparative ends, categories common to the various terrains in our study. In effect, categorization is different from the typology (Bourdieu 2016) in that, to this initial characterization of the protagonists in the project's fields of research were added three phenomena: a porosity between categories (a non-institutional environmentalism can take the form of an expert participating in local militantism, or a local technician advocating good practices in integrated management in international conferences, etc.); the multi-positionality of the individuals concerned (be it formal, for example a militant belonging to a local association who is also a member of a basin management committee or the head of a company; or informal, for example a civil engineer working in the water bureaucracy who is nevertheless active in the spheres of ecological militancy and public health). Lastly, the inter-relation of these categories via coalitions can give rise, as is highlighted in the ACF approach, to apprenticeships and to shared representations of conflicts and solutions. It is a question of understanding the fields studied by applying two traditional approaches which, in most cases, are opposed to one another. On the one hand, a sociology of public action that focuses on "improbable" interactions and the emergence of clusters of sociologically composite interactions linked to public political issues; and, on the other, a sociology of social positions defined by social attributes that structure the social world in the long-term. This is the sense of the Bluegrass project, which is based simultaneously on the public policy coalition approach, and the sociology (attributes, trajectories, etc.) of the actors involved in specific coalitions. The fact that the project leads to a reflection on social, professional and political realignments in the sense of an ecologization of coalitions and water policy is essentially due to this original approach *(Box 1, p. 361)*.

When a conflict involves the development of major infrastructure or new sources of supply, there are several categories of protagonists involved in water policy; even during droughts, there are advocates of economic development (Category 1),

whether realtors (Arizona), agro-industrialists (Mexico), industrialists (Brazil), or professionals in the tourist industry (Brazil). Indeed, they are reminiscent of the "growth coalitions" analysed in other urban contexts (Logan, Molotch, 1987; Stone, 1989). In regard to decision-makers in institutions, it was possible to distinguish, on the one hand, the advocates of "good management" and "good practices" (C2), who often have a background in the law and in economics, and, on the other, the various components of state bureaucracies, mainly water administrators (C3), who affect the implementation of legislation by means of their advocacy of technical and/or economic criteria. It was decided to include policy personnel in Category C3, in spite of distinct careers and periods in which individuals were active, but in virtue of the level of action they share. This is what distinguishes this category from the following one, which covers technico-administrative personnel (C4). Members of this category not only occupy positions in which they have less access to decision-making capacity, but, above all, they exercise more specialized functions below the level of policy decisions. These water sector professionals are civil engineers and hydrologists, who are capable of taking on subaltern administrative responsibilities (running water processing plants, etc.).

1. Categories of water sector protagonists

1. Advocates of economic development (agro-industrialists, industrialists, realtors, etc.).
2. Advocates of "good practice" in management (law, benchmarking, etc.).
3. State administrators (civil servants and elected politicians, lobbyists, etc.).
4. Technicians and managers in the water sector (engineers and other water professionals, etc.).
5. Experts (scientists engaged in militant activities, applied research, or consultancy).
6. Institution-based advocates of conservationist measures (local, state, or federal institutions).
7. Non-institutional environmentalists (militants, members of NGOs, residents who are militant about specific environmental themes, etc.).

However, one of the main difficulties was to avoid falling into the trap of a classic bias in the sociology of social movements, namely a tendency to analyze conflicts from a relatively polarized perspective, focusing on groups mobilized against the government. The diversity of origins of the conflicts studied meant that it was not possible to reduce them to a specific type of protest, notably to the action of an "active minority" informed by purely ecological considerations, with militant

action based on the work of environmental organizations and of local committees. As well as these non-institutional ecologists (C7), it was possible to isolate groups mobilized within the administrations tasked with managing water, groups whose practices and postures have become closer to the ecological perspective (C6). This institutional environmentalism, which attempts to impose conservationist measures from within the decision-making process, is also, in many cases, based on scientific expertise likely to legitimize a change in the orientation of water policies (C5). Thus, the risks of water shortages in Arizona, Mexico, and Brazil are the object of a large academic literature developed by hydrologists and geographers teaching at universities (the University of Arizona in the USA, UNAM in Mexico, USP in Brazil, etc.) and regularly taking part in commissions, public meetings, and workshops on the water crisis. However, academic expertise can also be mobilized in support of protest against current water policies, notably with a view to publicizing the sustainability objectives of the official missions of local and state water agencies.

Thus, taking into account the specificity of individual terrains and national situations, seven types of positions were defined. From the point of view of links between protagonists, the combination of relations between the different groups studied made it possible to define the formation and realignment of coalitions more accurately. For example, in Arizona the promotion of water policies is the result of the action of what was initially a minority coalition in which institutional environmentalists (C6), supported by non-institutional environmentalists (C7) at the most local level, as well as by a few well-known academic experts (C5), were able to persuade water professionals in state administrations (C3) and technical services (C4) to introduce instruments that were at once innovative and consensual to fight drought (planning, the use of waste water, storage, environmental norms, etc.), thereby acting against the wishes of the representatives of economic forces (C1) who wanted to pursue urban expansion in the region. Another example is provided by the situation pertaining in Duque de Caxias in Brazil, where, unlike in the configuration described above, we observe an alliance between an industrial growth coalition (C1) and political enterprises enjoying a form of state power (C2), and technicians in the water sector (C4) that have, for many decades, defended the Guandu dam and its extension. Nevertheless, two coalitions run counter to this somewhat univocal trend. One of them focusing on the ecologization of public policies led by institutional actors, politicians, administrators and technicians (C6, C4) in fragile interactions with non-institutional environmentalists and academics and researchers from a health foundation (C7, C5); while the other, which encompasses technicians in the water sector (C4), as well as politicians and technicians (C6, C4), seems to have recently become open to the prospect of applying a new level of management (inter-municipal) and a transformation of the cause, and toward an ecological management of the Bay of Guanabara and a network infrastructure for the populations of segregated cities.

Table 1 - Summary of the conflicts and coalitions studied

	Identification of the conflict	Main reason for the conflict	Configuration of the coalitions	Structure of the network (*)	Outcomes: instruments of water policy	Impacting factors and interpretations for decision-making
1	La Paz (Bolivia)	Shortage of the service due to insufficient water storage	Dominant state institutions, opposed to municipalities and resident organizations	3-Small-sized network, small extent, with a high degree of cohesion, very dense, little modular and little fragmented	Hydro-engineering and more water supplies	Political over-determination Usual engineering solutions
2	Pima County (USA)	Competition for rare hydro resources in a context of draught with risks of water shortages	State and county, opposed to developers	1-Large-sized network, extended, with an average degree of cohesion and an average density, but a low modularity which makes it little fragmented	Environmental engineering and conservationism	Building consensus. Engineering training vs. managing skills
3	Lima (Peru)	Competition for water regulation and management competencies in scarcity context	State and sewage operator in a dominant coalition, opposed to an emergent ecological coalition with heterogeneous profiles and interests	2-Large-sized network, extended, with a low degree of cohesion, low density and high modularity which makes it very fragmented	Water council as instrument for IWRM implementation	Implication of new protagonists and emergence of alternative models of water management without questioning the dominant model
4	Billings (Brazil)	A contested project of water transfers between two basins and its consequences in terms of maintenance	A dominant politico-technocratic coalition, opposed to an eco-social coalition promoting social participation and environmental perspectives	2-Large-sized network, extended, with a low degree of cohesion, low density and high modularity which makes it very fragmented	Project financed by World Bank, no participation of resident populations	Social movements against the Project, without real coordination and political benefits.
5	Ilhabela (Brazil)	Water scarcity producing unequal distribution of the service (consumptions, etc.)	A dominant politico-technocratic coalition, opposed to non-institutional environmentalists	3-Small-sized network, small extent, with a high degree of cohesion, very dense, little modular and little fragmented	Action plan on a metropolitan level for an alternative water system	Centralized decision process

	Identification of the conflict	Main reason for the conflict	Configuration of the coalitions	Structure of the network (*)	Outcomes: instruments of water policy	Impacting factors and interpretations for decision-making
6	Ubatuba (Brazil)	Water shortages and contamination of peripheral areas	A coalition of local government and basin representatives, opposed to a coalition focused on the economic promotion of the territory	3-Small-sized network, small extent, with a high degree of cohesion, very dense, little modular and little fragmented	Creation of a local committee in order to implement national policy	Reinforcement of local powers
7	Duque de Caxias (Brazil)	No access to water for most of the residents, while industry has privileged access. No municipal planning, in contradiction to Federal Law of 2007	A dominant politico-technocratic coalition (state institutions and engineers from Rio state company), opposed to social movements and unions	2-Large-sized network, extended, with a low degree of cohesion, low density and high modularity which makes it very fragmented	Municipal plan to get more water with new infrastructures	Centralization and concentration of management skills. Current creation of an inter-municipal organization for shared investments in urban services
8	13 pueblos (México)	Wells perforation in order to use groundwater for urbanization	A coalition of local forces and experts, opposed to the government	3-Small-sized network, small extent, with a high degree of cohesion, very dense, little modular and little fragmented	No change in water policy: perforations and technical solutions to implement infrastructures	No coalition between communities and experts
9	El Zapotillo (México)	Decision to build a dam to transfer water to the state of Léon (risk of inundation of three villages) => different visions of water policy	A coalition against the dam (communities and observatory), opposed to the promoters of the dam (producers, agricultural and industrial sectors, governments of Jalisco and Léon). A third coalition (historic coalition) is opposed to the project as a community preservation effort	3-Small-sized network, small extent, with a high degree of cohesion, very dense, little modular and little fragmented	Creation of an Observatory as an instrument of public policy	Provisional project shutdown

	Identification of the conflict	Main reason for the conflict	Configuration of the coalitions	Structure of the network (*)	Outcomes: instruments of water policy	Impacting factors and interpretations for decision-making
10	A. Ley General de Aguas (México) - Conflict at national level	A. Reform of the legal frame of water on a national level. Application of 2012 law.	A socio-environmental coalition (experts, academy) promoting alternative solutions like rainwater recovery, etc., opposed to a political-technical coalition (engineers) in favor of infrastructure constructions and water transfers. Intermediaries from a private fundation	1-Large-sized network, extended, with an average degree of cohesion and an average density, but a low modularity which makes it little fragmented	A. Blockage of legislative debates and of the proposal of decentralization law for hydric bureaucracy	Re-centralization policy. Emergence of new protagonists trained in social sciences and environmental engineering
	B. Lago de Chalco (México) - Local conflict	B. Role of participative institutions			B. Creation of a river basin committee; alternative planning for the lake as new instrument	
	C. Saltillo (México) - Local conflict	C. Private management of water			C. Remunipalization of water management	

(*) A typology of the network structure into three classes was elaborated from the following metrics: number of vertices and edges, diameter, average geodesic distance, density, modularity and number of communities.

The compositions of coalitions: variables and scenarios

A multi-dimensional modelization

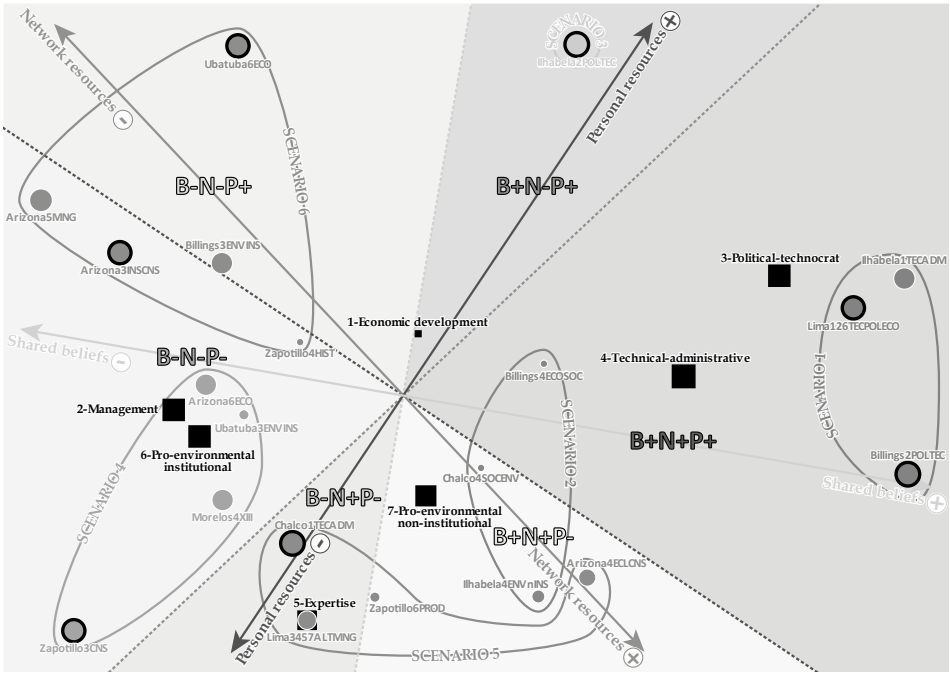
First, case studies can be listed descriptively based on the causes of the conflict, on the configuration of the coalitions observed, on the structure of the network, and on the instruments of water policies implemented in the wake of the contract *(Table 1, p. 363).* Nevertheless, it is not a question here of constructing any causality between coalition systems and water policies generated by them. In effect, in order to reveal evidence of this causality, it was necessary to build a methodology designed to provide an accurate description of the decision-making process, including information concerning who talks to whom at the moment a choice is made or an instrument abandoned, on the basis of what arguments, how, and when; who brings what solution and when, etc. Since no methodology of this kind was systematically developed within the framework of the Bluegrass project (direct observation of meetings, email correspondence, access and monitoring in the decision-making process concerning financial and technical dossiers), the project does not lay claim to an interpretation based on the causality between coalitions and choices of instruments of public policy at the center of our observations. Nevertheless, since coalitions are one of the explanatory variables of the policy process, the qualitative analysis of each case study can contribute to an ensemble of interpretative hypotheses concerning the subject.

The comparative analytical framework established on the basis of the case studies made it possible to better the define the variables determining the composition of coalitions and to develop scenarios describing the emergence or realignment of water policy coalitions linked to conflicts about water. The results reveal several types of relationships between coalitions. In order to provide more than a mere typology of conflicts, motives and protagonists, the comparative approach consisted in isolating the relevant variables needed to understand the way in which conflicts influence the realignment of coalitions. The interpretative framework used to gain an understanding of the various factors impacting the decision-making process in each case study makes it possible to compare the coalitions involved, the structure of the network, and the instruments of public policy applied. The comparative modelization of case studies is based on the principle according to which the structure of coalitions, bringing into play different resources employed by the protagonists of the water sector throughout the network, are articulated around three types of variables or dimensions considered as independent. These are, *shared beliefs (B)*, or the sharing of ideas between the members of a single coalition about the causes of the conflict, about the problem posed, and about the kind of policies that should be implemented to resolve it; *network resources (N)*, which designates the means of action associated with a coalition's position within the network, and the perception of the kind of influence

associated with that position; and *personal resources (P)*, a term covering not only the scientific, institutional and technical characteristics acquired by individuals over the course of their academic and professional careers, but also their militant activities and their capacity to exert influence and take decisions.

The multi-criteria analysis taking these three dimensions into account and covering twenty coalitions identified in the various terrains studied in the project, describes several scenarios associated simultaneously with the relative number of beliefs and positions shared by protagonists in the water sector, and with the nature of resources on which they focus. In terms of schematization *(Cf. Figure 12.1),* all the coalitions isolated in each of the terrains are represented by a point, while the scenarios are represented by lines of the same color surrounding the coalitions. Coalitions enjoying a dominant position in conflicts are circled in black. In this analytical approach, which constitutes the most effective representation of the system analyzed (taking into account 82% of the information), the axis of each dimension is figured by a solid line with an arrow at each end (systems of gaps from the negative to the positive). Green lines represent *shared beliefs*, blue lines *network resources*, and red lines *personal resources*. The corresponding opposed zones are indicated by means of a dashed line.

Figure 12.1. Comparative analysis plan of the structure of coalitions according to variables B, N and P (see the graph with colors p. 438)



The factor that makes the largest contribution to differentiating the various scenarios is *shared beliefs*, followed by *personal resources*, and, lastly, *network resources*. This makes it possible to divide the analysis plan into six segments respecting the preponderance of each of the three dimensions, and to determine for each of the segments its proximity to the ACF model. It is therefore, generally speaking, possible to distinguish three configurations. In the first, the Segment B+N+P+ (pink) and Segment B+N+P- (yellow), emphasizing shared *beliefs* and relational resources, are those which are closest to the ACF approach. In the second configuration, the Segment B+N-P+ (mauve), while giving more importance to shared beliefs, implies fewer relational resources and, consequently, is further away from the ACF approach than the preceding ones. At the same time, this configuration is worthy of particular attention due to the fact that personal resources play a significant role. In the third configuration, the three segments, B+N+P- (green), B-N-P+ (blue), and B-N-P- (gray) give relatively less importance to shared beliefs and are, consequently, farther from the ACF model. The distribution of coalitions in these six segments makes it possible to ascertain the degree to which they conform to the ACF model depending on the composition of the three dimensions.

Furthermore, the inclusion of seven categories of protagonists (black squares) on the comparative analytical graphic illustrates the potential influence of this indicator within each scenario, the proximity of a certain type of protagonist with a specific coalition representing a relative overrepresentation of one of the seven categories in one of the coalitions. We also introduced other illustrative variables, identified as relevant, into our description of the various scenarios: *typology of links, brokerage roles, organizational categories, levels of activity, perception of the system of conflict, influence and decision-making.*

Table 2 - Scenarios, characteristic dimensions, and coalitions

SCENARIOS	CHARACTERISTIC ASPECTS	DETAILS OF DOMINANT COMPONENTS OF COALITIONS
SCENARIO 1 : Strengthening of water bureaucracies	B+N+P+	- Technico-political and economic management (Lima, Duque de Caxias) - Politico-technocrat (Billings) - Technical-administrative (Ilhabela) 30 actors, or 8% of the actors.
SCENARIO 2 : Emergence of a militant ecological "civil society" coalition	B+N+(P+ ou P-)	- Socio-environmentalist coalition (Chalco-Saltillo-LGA) - Pro-environmental non-institutional (Ilhabela) - Ecosocial (Billings) 82 actors (21%)
SCENARIO 3 : Strengthening of the territorialized power of professionals in the water sector	B+N-P+	Politico-technocrat (Ilhabela) 12 actors (3%)

SCENARIOS	CHARACTERISTIC ASPECTS	DETAILS OF DOMINANT COMPONENTS OF COALITIONS
SCENARIO 4: Emergence of a *modus vivendi* coalition in favor of sustainable local development	B-N-P-	- XIII Village' Coalition (Morelos) - Economic development (Arizona) - Pro-environmental institutional (Ubatuba) - Conservative Coalition (Zapotillo) 74 actors (19%)
SCENARIO 5: Emergence of a conservationist coalition based on expertise	(B+ ou B-)N+P-	- Alternative management (Lima) - Productivist coalition (Zapotillo) - Technical-administrative coalition (Chalco-Saltillo-LGA) - Ecological Conservation (Arizona) 108 actors (27%)
SCENARIO 6: Emergence of an institutional conservationist coalition	B-N-(P+ ou P-)	- Institutional conservation (Arizona) - Pro-environmental institutional (Billings, Duque de Caxias) - Management and Planning (Arizona) - Economic promotion of the territory (Ubatuba) - Historic coalition (Zapotillo) 89 actors (23%)

The play of variables: Positioning of research vis-à-vis the ACF

The combination of the three dimensions (B, N, P) reveals three kinds of conflictual configurations and coalitional structures. It makes it possible to establish scenarios and assess their conformity with the ACF conceptual model. A strict application of the ACF approach would emphasize a configuration privileging shared beliefs (B), while extended versions of ACF, based on the model outlined in Lubell (2013) and Weible (2005), would also encompass the structure of the network (N), which facilitates the task of interpreting coalitions and, above all, evolutions in water policy. Taking account of individual skills, or, more broadly, individual characteristics (P), makes it possible to farther extend the ACF approach to include a very detailed understanding of the composition of coalitions and of what glues them together – the hypothesis being that some scholarly, academic, professional or militant characteristics tend to encourage the development of shared orientations and, therefore, the construction of links in the process of forming coalitions.

Of the eight possible combinations of the three variables, the results of the modelization applied to the conflicts studied in the Bluegrass Project deliver six distinct scenarios (Table 2, p. 368). However, they cannot be interpreted in a mechanical way and must be adapted to the specificity of the conflicts, problems and solutions studied, since, in a context of scarcity of resources, water policies are the result of a combination of a number of factors. These factors include urban growth, which accentuates the challenge of articulating urban services (often inadequate in marginal and semi-rural areas) in the form of a unified network in a particular territory (Lorrain 2009); and climate change, which accentuates

certain disequilibria within the regions studied by diminishing sources of supply, the overexploitation of water or its non-preservation (various forms of pollution). Water policies are, therefore, characterized by something of a crisis in traditional technical systems, or, at least, by the way in which they are placed in competition – a phenomenon that is varyingly apparent depending on the terrains studied – with alternative solutions, for example recycled water, the introduction of small, closed-circuit systems, the use of rain water or better planned approaches to storage. This calling into question of existing systems (often major hydraulic infrastructure) is referred to here as the "ecologization" of water policies. Interpreting the various scenarios made it possible to highlight the conditions of emergence, either more or less pronounced or marginal in the various terrains in the study, of the process of ecologization.

Scenario 1/ B+N+P+: Strengthening water bureaucracies (p. 439)

In the first scenario, the protagonists of the conflicts studied are mainly linked by shared beliefs; they work together by employing their shared resources, whether relational or personal, in order to develop coalitions. To this degree, this scenario conforms perfectly to the ACF model, demonstrating the importance of the structure of the network and of personal resources. In a context in which the level of conflict is thought of as moderate at most, a large majority of protagonists belong to state organizations, as well as to national and international institutions. These protagonists are management technicians and administrators. To a much lesser degree, advocates of economic development also have a role to play. Furthermore, we observed that they all had a capacity to exert politico-economic influence. When the links between them are not of pure coalition type, they are either hierarchical or established in the same institutional space.

This, coupled with the intensity of direct collaborative links and by their aptitude for decision-making, means that coordinating roles in those coalitions appear not to be as necessary, and "brokers" mainly serve as agents of communication between their own coalitions and the outside world with a view to comparing their positions. Two of the three coalitions in this first scenario are in dominant positions, suggesting that such a scenario unites the conditions required for coordinating actions capable of exerting an influence on the development of public policies by, specifically, boosting the capacity of water bureaucracies to exert influence via their support of economic development in the regions concerned. Consequently, these coalitions encourage continuity rather than change in existing water policy on major infrastructure and the quest for new sources of supply. This continuity is largely explained by the important role played by beliefs. In conformity with the ACF approach, beliefs function over the long-term and are more difficult

to change, even if the system is affected by external influences. In this scenario, competition between traditional policies tends to be the least marked, and the ecologization of public policies is either non-existent or marginal, to the degree that the actors who advocate it belong to dominated coalitions or are marginal in the dominant coalition.

Scenario 2/ B+N+(P+ or P-) : The emergence of a militant ecological coalition rooted in "civil society" (p. 440)

The second scenario is distinguished not only by the importance of beliefs (B+), but also by the structure of the network (N+). Here, coalitions that attempt to skew the system toward an ecological approach are composed exclusively of pro-environmental protagonists from "civil society". While they are closely bound by shared beliefs, they mobilize their shared personal resources in the formation of water policy coalitions less than do members of the first scenario, probably because their institutional impact is limited. However, this second scenario still conforms to the ACF model. Collaborations contributing to a pure coalition in the ACF sense of the term account for half the links, while the other half, which are much less formal, are shared, generally speaking, between institutional links and straightforward exchanges of information. Indeed, tensions between actors can emerge, even though, in this case, most of them are of a minor order. The composition of this scenario can be partially explained in reference to the diversity of actors included in it, actors mobilized by the high intensity of the conflict about water issues. To a large degree, the scenario not only involves civil society (local committees, often specialized NGOs, etc.) and members of the academic world, but also territorial institutions with a participatory vocation, for example water basin committees. Although most of them are protagonists with few institutional resources, they have, in the great majority of cases, a major capacity to exert social influence (most frequently at the territorial level) and, in a minority of cases, an additional influence in terms of politics, economics and expertise. Their heterogeneity, coupled with the nature of their links (mainly exchanges of information) and the existence of minor internal tensions, also, at least partially, explains the need, on the one hand, for a high level of coordination within coalitions and, on the other, for "brokers" to monitor exchanges between their own coalition and the outside world in order to better define their militant action, clarify their position and maintain a spirit of "good governance", consultation and participatory democracy. It should also be noted that there is no institutionally dominant coalition in this scenario; indeed, most of the time here, water bureaucracies are considered as adversaries, which explains why results in terms of changes in water policy are disappointing. If, in the long-term, protagonists in this scenario manage to produce changes in beliefs and representations about water resources

and services, they do not possess the institutional resources to transform those changes into effective policies, and only rarely deploy the kind of "institutional militantism" (Politix, 2005) that would enable them to impose their solutions. Moreover, this point poses the question of the specificity of water policies, notably in urban areas, linked to investments that are so substantial that they escape, unlike other policies, from the "institutionalized DIY" and "institutional militantism" that encourage this type of actor to become politically active (C5 and, above all, C7). The difference with the ACF model, based exclusively on beliefs, encouraged us to employ elements of a sociology of conflict in social movements and to take into account the structure of political opportunities (Külber, 2002) capable of boosting the impact of environmental demands.

Scenario 3/ B+N-P+: The strengthening of the territorialized power of professionals in the water sector (p. 441)

Meanwhile, the third scenario is distinguished by the fact that it is exclusively made up of protagonists closely linked in terms of their shared beliefs and personal characteristics. However, in this scenario, relational resources are exploited to a much lesser degree. Over half of the protagonists have links within a shared institutional space. They belong to a category of water administrators who only form coalitions when they belong to the same professional organization. Scenario 3 is different from the ACF approach in that it separates water bureaucracies from all other protagonists in a given conflict. Most of these water bureaucracies consist of gatekeepers; while the form of the conflict remains moderate, the beliefs and attitudes of those who are not part of the administration are considered changeable and, therefore, untrustworthy. Shared personal resources linked to shared skills (making it possible to belong to the same institution) are often exploited in the case in which coalitions do not include members of other organizations and, due to the influence they exert, those protagonists are regularly called upon to play the role of brokers between external coalitions. We are, here, confronted with a form of local mobilization, around 50 percent of which focuses on the municipal level, with the other half split between the local, inter-municipal, and regional levels. This scenario often describes the consolidation of the power exerted by water professionals over specific territories. Nevertheless, possibilities for change can arise when water bureaucracies apply their expertise to local problems, as is evidenced by the implementation of alternatives to major metropolitan infrastructure with a view to lessening risks of shortages and forestalling future protest. In this sense, this type of coalition is a hybrid between, on the one hand, what is described in the literature on the territorialization of public policy, and, on the other, what is outlined in the literature on the continued influence of hydrocracy. In effect, while this scenario clearly marks the junction between

various territories of problems and their solutions, as well as the innovative adaptations resulting from them, it also highlights a form of dependence on the traditional institutions of the water sector.

*Scenario 4/ B-N-P-: The emergence of a **modus vivendi** coalition in favor of sustainable local development (p.442)*

The fourth scenario emphasizes none of the three dimensions studied. Instead, it describes a context characterized by a high degree of conflictuality articulated around water issues in which, in most cases, only central actors are seen as being capable of maintaining their positions. Around one third of such links can be described as belonging to the "pure coalition" type (in the ACF sense of the term), since shared beliefs circulate, even if they are not more significant in terms of exchanges than shared relational or personal resources, which means that the scenario is substantially different from the ACF model. "Interested coordination" links, that bring into play exchanges of favors, are much more characteristic of changes than in other scenarios, and potentially antagonistic links in the coalitions concerned should also be noted, although it is a minor factor in this scenario. Institutional coordination, when it does occur, is not significantly characteristic, any more than is hierarchical coordination. The protagonists in this scenario are relatively heterogeneous in that they often include pro-environmentalists and advocates of economic development, who work-side-by side in a certain number of common initiatives designed to resolve conflicts. The great majority are city councils and local organizations, but "civil society" organizations (associations, NGOs, etc.) are also present, as is the private sector (which is relatively over-represented in this scenario).

Anchored in the local territory, the principle protagonists nevertheless enjoy access to national, federal and international levels of action. This highly conflictual context coupled with the wide range of interests represented and the potential tensions resulting from them explain the large number of coordinators in coalitions. Meanwhile, the significant role played by exchanges of favors means that relations between the coalition and the exterior are closely monitored. Since a large majority of these brokers wield a significant influence and decision-making capacity not only in the politico-economic, but also in the social sphere, they are often given roles as itinerant brokers vis-à-vis external coalitions. This scenario encompasses a wide range of environmental and economic concerns. The power they hold, as well as the pure coalition collaborations and exchanges of favors in which they are involved, sometimes foreshadow the emergence of *modus vivendi* coalitions focusing on local sustainable development, associated with other levels of action (national and international). The scenario reveals the realignment of coalitions intent on resolving conflicts by a minimum of consensus between divergent interests,

including, in particular, the adoption of policy instruments, presented as innovative, and designed to promote the ecologization of water policies.

Scenario 5/ (B+ or B-) N+ P- : The emergence of a conservationist coalition based on expertise (p. 443)

In the fifth scenario, only 20% of the links between actors with shared beliefs who work together directly are of pure coalition type (in the ACF sense). Although the most frequent and significant links are between those operating in the same institutional space (33%), it should be noted that there are almost as many links taking the form of the exchanges of information (29%), with the rest almost equally divided between hierarchical coordination (9%) and interested coordination (10%). More than personal resources, emphasis is placed on relational resources, which play a significantly more important role than shared beliefs, which means that the scenario is substantially different from the ACF model. Indeed, this modifies the scenarios of change elaborated by the ACF. It is not merely a question of external shocks (catastrophes, etc.) or the dominant coalition's apprenticeship of alternative solutions advocated by dominated coalitions, but is, in fact, the result of an equalization in the capacity to influence decisions. This scenario is characterized by a higher degree of diversity in terms of the types of protagonists it encompasses, the only ones missing being state administrators. It includes actors from all kinds of organizations other than water basin committees, and, furthermore, federal/national organizations, on the one hand, and regional/intercommunal/county organizations, on the other, most frequently occur in this fourth scenario. In the end, with the exception of international organizations, other categories of organizations are almost equally represented. But this scenario is also specific in regard to the level of activity of the actors involved since, in effect, it is here that the international and federal/national levels are best represented. The fact that the scenario contains so few international organizations suggests that it is actors from other categories of organization that succeed in spreading their level of activity on the international stage.

In fields in which the perceived level of conflict about water issues is considered to range from intense to moderate, and in which it is accepted that it is primarily central actors who, firmly and unambiguously, hold onto their positions vis-à-vis other actors, the diversity of actors and their levels of activity calls not only for the introduction of coalition-based coordinating roles, but also of representatives and gatekeepers tasked with ensuring that access to adequate resources is provided by the global network. Over half of these actors have the capacity to exert influence and take decisions, with the other half possessing specific expertise and influence in the politico-economic sphere. At the same time, a quarter of them are able to wield social influence.

Personal resources also make it possible to increase exchanges of favors within coalitions. One of the four coalitions in Scenario 5 (Arizona) is a dominant coalition. It is also the most local and least international of the coalitions. This scenario seems to unite conditions encouraging the emergence of a coalition of experts favorable to relatively moderate water conservation policies.

Scenario 6/ B-N-(P+ or P-): The emergence of an institutional conservationist coalition (p. 444)

The sixth scenario is the farthest away from the ACF model in that shared beliefs and relational resources are largely under-represented in exchanges between protagonists, and only shared personal resources play a significant role. If the network is similar to ordinary public policy networks such as those studied by Marsh & Rhodes, for example, interested coordination links taking the form of exchanges of favors are the most significant in the scenario, other links primarily consisting in exchanges of information. Hierarchical and, above all, institutional links play a significantly less important role. The types of protagonist in this scenario are divided into pro-environmentalists, managers, and economic developers. Almost half the main protagonists here belong to state organizations, while the others are distributed between city governments, civil society, and the private sector. Levels of activity reflect the same logic – half of them are located at the state level, while the rest vary from the regional/intercommunal level to the local level. Meanwhile, federal/national levels of activity are not significant. Although consensus appears to dominate in this institutional context, the level of conflict is perceived as intense, and the water sector protagonists considered to be the best established in their positions are primarily those actors who have the most influence. These considerations mirror the relational practices of the protagonists in this scenario, most of them equipped with a capacity of influence and decision-making powers in the politico-economic, technical, and social spheres, who are capable above all, of mobilizing personal resources within the framework of the favors they exchange, and pool their shared professional and academic backgrounds in order to come to an understanding. This monitoring of exchanges also extends to relations within their own coalitions and with external actors who recognize their expertise, and who sometimes use them as itinerant brokers. Consequently, this scenario unites the conditions necessary for the emergence of what we refer to as institutional conservationist coalitions. Water conservation policies that create consensus in tense situations are the product of a realignment of coalitions articulated around certain institutions that play a central role and need one another to rally the ensemble of water professionals to their cause, or to impose their policies in crises calling into question the way in which the system functions (drought, contamination, etc.).

The various scenarios studied in the Bluegrass project present not only different combinations of variables, but also common issues, and, sometimes, comparable processes. One should note the continuing influence (even if that influence is frequently contested) of water bureaucracies, to which can be added several categories of protagonists – state administrators, water technicians and managers, and even, in sometimes opposed policy strategies, institutional advocates of good management practices and water conservation measures. In order to understand why how can be referred to as the ecologization of water policy emerges, a process that calls these hydrocracies into question, is of fundamental importance. In effect, the kind of engineering expertise which, emerging in the 19th century eventually led to the introduction of networked urban services, is criticized on the one hand, on the grounds of the urban growth of the zones considered, which undermines the traditional link between territories and operators (Lorrain 2008), and, on the other, in regard to the increased scarcity of, if not water resources, a phenomenon often associated with climate change, then at least of water supply in cases in which competition for the appropriation of the resource becomes intense. This is the case for Arizona and the Colorado Basin.

One of the principle results of the comparative study of conflicts is that it reveals how these environmental constraints are dealt with by water bureaucracies. While we might expect them to be contested from the outside by ecologist organizations, this is true in only a minority of cases (mainly in Scenario 4); in reality, hydrocracies tend to appropriate environmental issues in order to render them socially acceptable to advocates of economic development and politicians alike. This analysis of the ecologization of water policy is, from a certain point of view, supported by observations regarding the emergence of sustainable development in administrations in which, while ecological militantism plays, at best, a marginal role in the institutions that count in the policy process (Béal, 2010), its specific contribution is to refine and make explicit the components of that process. For example, in the State of Arizona, where serious drought implies a substantial risk of water shortages, water conservation policies have been promoted by a coalition including water protagonists active at various levels (state, county, city) who share professional and technical expertise (Molle, 2009). To a large degree, interactions within water policy networks are structured by the career paths of water professionals, who highlight the importance of common technical and institutional skills – notably insofar as engineering is concerned – within a community articulated around shared issues.

It remains to be seen how the ecologization of water policy is inscribed in various dynamics and processes in function of the configurations of individual conflicts and the type of resources mobilized in them. The combinations of actors involved in conflicts described in the Bluegrass project must be examined in detail in order to develop more general hypotheses.

The structure of dominant coalitions and levels of action: ways in which alternative approaches to ecological management can be taken into account

The analysis of dominant coalitions: Institutional militantism and hydrocracies

The ambition of the Bluegrass project was to analyze, on the basis of data gathered in the field, the emergence of political coalitions articulated around issues concerning water, and to see how these coalition-based actions can lead to the development of public policies. The results make it possible *to validate the hypothesis according to which the analytical framework should contribute to the ACF model by adding to the two aspects of shared beliefs and relational resources a third, equally essential aspect, namely personal resources.* Indeed, the combination of these three aspects revealed itself to be instrumental in isolating significant differences characterizing the scenarios described above.

The results also enabled us *to validate the second hypothesis, according to which the contexts of emergence of policy coalitions cannot be reduced to the action of a single interest group*. While the first, second and third scenarios are all specific to a single category of protagonists within the dominant coalition, the other scenarios involve several groups that take different approaches to forming alliances and work together in different ways depending on institutional configurations and the structure of policy opportunities available *(Table 3, p. 378).* In this sense, our survey enables us to strengthen the ACF analytical model, according to which coalitions are rooted in the interrelations between a multiplicity of protagonists, which, consequently, renders an analysis of the policy process more complex.

On the other hand, the comparative framework deployed in the survey shows that *dominant coalitions do not emerge exclusively in situations that strictly correspond to the ACF model*. Some dominant coalitions have focused less on shared beliefs and more on mobilizing the personal resources of their protagonists than on defending their positions, as in Arizona (USA) and Ubatuba (Brazil) *(Table 4, p. 379).* While, unsurprisingly, dominant coalitions do not all emerge within the same scenario, our results show that every scenario, expect for the second one, is capable of providing the conditions of emergence of a dominant coalition *(Table 5, p. 379).* Nevertheless, it transpires that the decisive factors in actions undertaken by coalitions succeeding in developing public policy is, traditionally, influence and decision-making. Two other factors – the mobilization of personal resources shared by all the protagonists, and the level of activity of the institution to which protagonists belonged (particularly if it is federal) – are also, to a lesser degree, significantly characteristic of these dominant coalitions. In fact, the types of protagonists under which the dominant coalitions fall are clearly identified: State administrators; technical-administrative; pro-environmental institutional and pro-economic development.

The analyses also make it possible to validate the third hypothesis, according to which conflicts about water cannot be reduced to a systematic, polarized opposition between protestors, on the one hand, and the government, on the other. The analysis of the link between coalitions and conflicts (the *contentious*) demonstrates that the way in which water bureaucracies adapt to water policies is correlated to the emergence of alternative approaches to water management. More generally, water policies developed by water bureaucracies have to be adjusted to the territories and residents for whom they are responsible. Four mechanisms, amply illustrated in the conflicts studied, can be set up in this context of evolution toward a crisis in water bureaucracies:

- A recomposition of coalitions which has the effect of reinforcing them: Lima (Peru), La Paz (Bolivia), Billings (Brazil), Duque de Caxias (Brazil), Morelos (Mexico).
- The emergence of minority alternatives: Chalco-Saltito-LGA (Mexico).
- The movements of non-ecological local authorities: Ilhabela (Brazil), Zapotillo (Mexico).
- A majority recomposition with an ecological vocation: Ubatuba (Brazil), Arizona (USA).

Table 3 - Number of coalitions per type of protagonists by the scenarios they rely on

Type of protagonist	**SCENARIO 1** *Strengthening of water buraucracies*	**SCENARIO 2** *Emergence of a militant ecological coalition from "civil society"*	**SCENARIO 3** *Strengthening of the territorial power of water professionals*
1- Economic development	1		
2- Management			
3- State administrators	2		1
4- Technical-administrative	2		
5- Expertise			
6- Pro-environmental institutional			
7- Pro-environmental non-institutional		3	
Total	**5**	**3**	**1**

Type of protagonist	**SCENARIO 4** *Emergence of a* modus vivendi *coaliton in favor of sustainable local development*	**SCENARIO 5** *Emergence of a conservationist coalition based on expertise*	**SCENARIO 6** *Emergence of a conservationist institutional coalition*
1- Economic development	1	1	1
2- Management		1	1

Type of protagonist	**SCENARIO 4** *Emergence of a* modus vivendi *coaliton in favor of sustainable local development*	**SCENARIO 5** *Emergence of a conservationist coalition based on expertise*	**SCENARIO 6** *Emergence of a conservationist institutional coalition*
3- State administrators			
4- Technical-administrative		1	
5- Expertise		1	
6- Pro-environmental institutional	2	1	2
7- Pro-environmental non-institutional	1	2	1
Total	**4**	**7**	**5**

Table 4 - Dominant coalition and strict adequacy with the ACF

Average values of the three dimensions for each dominant coalition in the field study		**Strict correspondence to the ACF**					
		Yes			**No**		
Country	**Field study**	**Shared beliefs**	**Network resources**	**Personal resources**	**Shared beliefs**	**Network resources**	**Personal resources**
Brazil	Billings	83	75	74			
	Ilhabela				75	45	78
	Ubatuba				33	42	74
Mexico	Chalco-Saltillo-LGA				51	56	53
	Zapotillo	51	48	41			
Peru	Lima				75	69	80
USA	Arizona				33	44	61

Table 5 - Dominant and non-dominant coalitions per case study based on the scenarios on which they rely

Field study	**SCENARIO 1** *Strengthening of water bureacracies*	**SCENARIO 2** *Emergence of a militant ecological coalition from "civil society"*	**SCENARIO 3** *Strengthening of the territorialized power of water professionals*
Lima (Peru)	1		
La Paz (Bolivia)	1	1	
Billings (Brazil)	1	1	
Duque de Caxias (Brazil)	1	1	

Field study	**SCENARIO 1** *Strengthening of water bureacracies*	**SCENARIO 2** *Emergence of a militant ecological coalition from "civil society"*	**SCENARIO 3** *Strengthening of the territorialized power of water professionals*
Morelos (Mexico)	1		
Ilhabela (Brazil)	1	1	1
Chalco-Saltillo-LGA (Mexico)		1	
Zapotillo (Mexico)			
Arizona (USA)			
Ubatuba (Brazil)			

Field study	**SCENARIO 4** *Emergence of a* modus vivendi *coalition in favor of sustainable local development*	**SCENARIO 5** *Emergence of a conserveationist coalition based on expertise*	**SCENARIO 6** *Emergence of a conservationist institutional coalition*
Lima (Peru)		1	
La Paz (Bolivia)			
Billings (Brazil)			1
Duque de Caxias (Brazil)			1
Morelos (Mexico)	1	1	
Ilhabela (Brazil)			
Chalco-Saltillo-LGA (Mexico)		1	
Zapotillo (Mexico)	1	1	1
Arizona (USA)	1	1	2
Ubatuba (Brazil)	1		1

Note: A grey-colored cell indicates the scenario of the dominant coalition for the field study.

The crisis of hydrocracy: states and metropolises confronted by tensions within urban networks

The analysis of the case studies demonstrates that, as has been conclusively established by the ACF approach, it is difficult to change beliefs, particularly "core beliefs", and that change in the field of water policy is linked to factors external to the system considered. The task at hand is to determine the extent to which the configuration of coalitions impacts how water policies are adapted to factors of change. Several variables are worthy of attention in an analysis of such adaptations. The first is the *distribution of sector-based skills* in different institutions in the field of water management. The distribution of skills can be highly concentrated, for

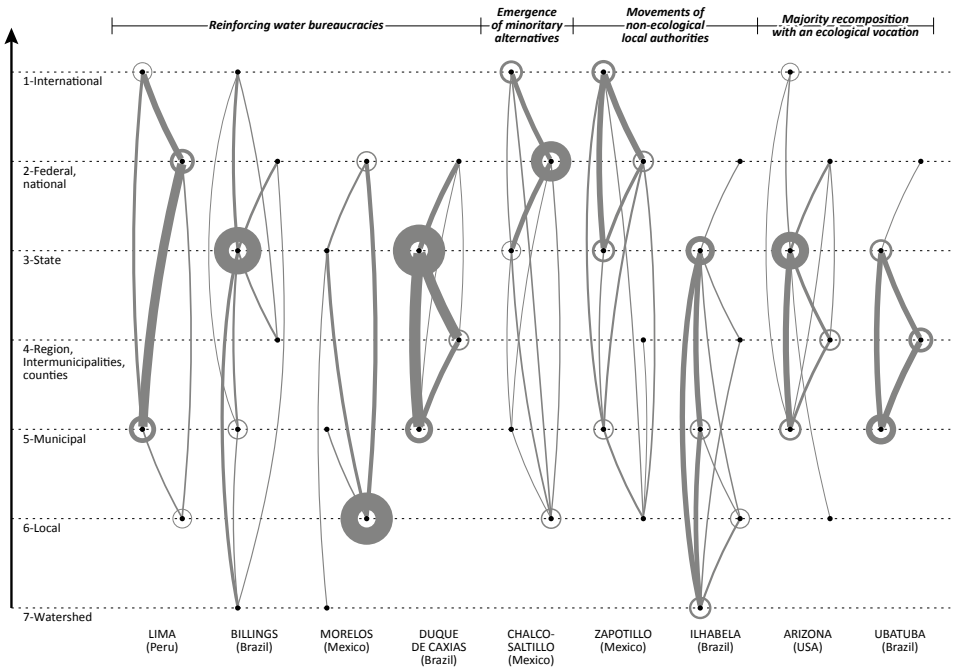
example in the technical corps of civil engineers, as in Brazil, Bolivia, and Peru. Meanwhile, case studies from the United States and Mexico show the emergence of other corps, with other skills, notably in the environmental field.

The second variable is the *distribution of those skills according to different levels of action*. If skills are regularly distributed in two institutional spheres, namely state companies, on the one hand, and the federated state, on the other, the ecologization of water policies for its part, through the emergence of other fields of technical knowledge (public health, technical alternatives, etc.), occurs in the spaces in-between those levels of action *(Cf. Figure 12.2, p. 382)*. As is shown in the cases of Duque de Caxais, and Billings in Brazil, concentrations of skills have the effect of creating polarized coalitions focused, on the one hand, on the federated state and its sector-based institutions specializing in water (hydrocracy), and, on the other, on organizations promoting more marginal expertise (public health, small systems, etc.), which attempt to structure their links with social movements. But these two types of coalitions have few links. The structure of the networks studied reveals a disconnection between the level of conflicts about access to water (connection to the supply and processing network) at the local level in the neighborhoods of peripheral towns, and the level of a type of expertise about water (civil engineering) which monopolizes policy decision-making and which is concentrated at the state level. This example demonstrates that conflicts and policy-making are best understood by comparing two variables, namely levels of action and spheres of commitment. On the other hand, in the USA, as is demonstrated by the case of Arizona, the central role of water bureaucracies can only be understood in terms of the inter-dependence of various levels of action. In effect, state administrations depend on local institutions to promote "sustainable" water policies. But this inter-dependence also makes it possible, at the local level, to consolidate a process of ecologization of water policy based on other, more environmental types of skills.

The preceding analyses are linked to a traditional issue in the field of the historical sociology of the state, namely that of the autonomy of the state and its segments, and to a Weberian approach to that issue (Badie, Birnbaum, 1979; Deloye 2007). This literature insists on the fact that the construction of states is historically based on a differentiation between the institutional rules and structures of the state and those of society. The various forms of the state are, thus, the consequence of how starkly the state and society are differentiated. Generally speaking, Scenarios 1 and 3 are defined by the marked autonomy of hydrocracies that control policies in the water sector. This is true in cases where dominant coalitions are most focused on the technical resources and values of the state and on the levels of management in which the state's hydrocratic power is concentrated (often the state). On the other hand, Scenarios 4 to 6 reveal a marked differentiation (Birnbaum, 1985) of segments of the state specializing in water management, which makes it easier to "ecologize" water policies. This is true in the case where dominant coalitions are most open to

protagonists from areas other than the water sector. Nevertheless, some scenarios are hybrid: the autonomy of water bureaucracies and the process of ecologization are not necessarily incompatible when local and international levels introduce values and solutions different than those of the bureaucracies (for example, Arizona and Ilhabella). The issue of the autonomy of the state is by no means secondary in terms of the management of environmental issues, in regard to which the normative literature contents itself with focusing on a managerial and bureaucratic stake considered as fundamental in terms of making the green transition possible. Environmental policies can only be successful if they are desectorialized, or, in other words, if there is simultaneously an articulation between bureaucratic sectors and a de-differentiation of the state capable of introducing an increased level of coordination between bureaucratic segments and "civil society". The Bluegrass project confirms that debate on the subject has not reached a conclusion. In effect, the debate on the autonomy of the state, as represented by the historical sociology of the state, should be reanalyzed in terms of new approaches to the policy process. The ACF model, as applied in our research, shows that the variable of the autonomy of the state is not incompatible, in specific conditions (Scenario 3 and 6), with the definition of problems and solutions from outside the enclosures of the state and its relatively autonomous sectors.

Figure 12.2. Distribution of conflicts according to levels of action



In the end, the multi-level dimension of conflicts about water seems to be relatively paradoxical. At first sight it could take the form of a "State comeback" similar to the phenomenon described by Skocpol *et al.* (1985). However, such a diagnostic should be nuanced, because the state has never really withdrawn from the field of water policy (even in the American West, water is too important to be entrusted to the private sector), and the power of hydrocracies is sometimes less of an effective power and more of an issue in which the calling of management models into question serves as an opportunity to encourage longer-term transformations in water policy. When policy is not called into question in the facts, as in Bolivia and Mexico, the state retains the power to define water management modes. The Arizona case study reveals a water bureaucracy that incorporates the conservationist measures promoted by local administrations to the extent that its capacities of action are defined by the fact that institutions are dependent upon one another in their struggles with growth coalitions, which in spite of their pro-sustainability rhetoric, continue to advocate urban development. Between these two configurations, a whole range of intermediary cases can be defined, for example, the emergence of ideas advocating long-term sustainable management (Rio), developed in a framework compatible with traditional policies focusing on increasing offer and developing infrastructure projects.

Another contribution made by the comparative approach is that, through the various configurations examined, it highlights if not the emergence, then at least the consolidation of a specific level of action, namely that of metropolises, and inter-urban or regional institutions acting between cities and states. Of course, this quest for "good level of action", which is to be found in the literature covering all contemporary public policy (Faure et al., 2007), also encompasses the water sector. Urban policies are particularly subject to the recomposition of territories they are designed to manage in, leading toward a metropolisation of decision-making and implementation processes. In a context where water resources are becoming scarcer, due to urbanization and ecological transition, urban expansion causes crises in urban network services, in which a single operator is responsible for a single territory (Lorrain 2008) and calls into question the way in which states and cities are usually articulated. The emergence of "XXL Metropolises" like São Paulo, Mexico City and Lima has impacts on infrastructures and urban services: "The option retained in industrial countries since the late 19th century has been a unique technical network managed a company integrated as a monopoly applying a unique tariff (…). This approach made it possible to provide the urban space with infrastructure while at the same time reducing unit costs by sharing overheads with as many users as possible. However, the approach is far from universally applied in XXL metropolises. These cities develop very quickly; indeed, the occupation of space sometimes precedes the introduction of technical networks. Besides cities equipped with advanced infrastructure networks, we should take into account marginal areas

where the influence of institutional and infrastructural density is not as great. This reveals another dimension of large cities, where entire neighborhoods are outside official circuits and where local people tinker as they can standalone solutions" (Lorrain, 2011). Another consequence of these accelerated urban transformations is the emergence of internal antagonisms associated with the introduction of urban services. In this context, XXL metropolises reveal processes that are also current in other cities whose territorial extension pushes back the frontiers of urban space (Poupeau, 2009), as is the case of La Paz, Tucson and Rio, but whose lesser rates of growth and smaller scales still allow for solutions (and engineering skills) provided by water bureaucracies.

* * * * *

In spite of the exploratory nature of the comparison between case studies, the scientific contributions made by Bluegrass project are of a number of different orders. The first is methodological, taking the form of a shared analytical grid that makes it possible to do more than merely juxtapose case studies, and, instead, develop an international comparison and a detailed understanding of multi-level logics that go beyond national differences, in terms of both institutional architecture and environmental regulations. The development of this comparative international model, based on the analysis of public policy coalitions and a qualitative-quantitative methodology elaborated specifically for the project, allowed to modify the initial perspective of the study. Starting from an analysis commonly focused on protests addressed to governments by local people, often provoked by issues such as contaminated water, inequalities in access to the service, or a rejection of the privatization of water companies, the logic of the resarch shifted the emphasis to include an exploration of water management models that involve complex administrative structures simultaneously dedicated to urban services and embedded in power issues beyond their control. The perspective changed from a local narrative about extremely polarized situations, focusing on the capacity of "civil society" to protest, to an examination of social and institutional logics governing the implementation of water policies in specific national bureaucratic fields referred to as "hydrocracies". While most conflicts about water play out at the local level, their causes reflect logics governing other levels. The norms associated with management models are both national and international, and encompass the uses and transfers of skills, the history and configuration of institutions, socio-professional profiles and the resources accessible to protagonists in the sector, the relative strength of external constraints, and the capacity to integrate international norms, etc.

The contributions of the project also concern an understanding of the formation of coalitions based on case studies selected with a view to studying the effects of urban growth and climate change on access to water and on water

distribution services. The various problems concerning access to water cannot be exclusively laid at the door of urban infrastructure issues. Indeed, they raise the question of the management modes applied by water bureaucracies focusing on major projects throughout the territories for which they are responsible. This questioning, whether or not it leads to effective change in management modes, reveals various processes of ecologization in water policy depending on of the kind of coalitions that develop within individual configurations. In effect, the protagonists of conflicts about water, conflicts which have often been reduced to an opposition between local residents, on the one hand, and the government, on the other, also involve the input of bureaucracies responsible for water policy. In contexts of scarcity (climate change, urban growth, reduction of funding for infrastructure for new sources of supply), struggles over the imposition of water policies are also struggles over knowledge, savoir faire and technical skills opposing actors with different resources such as the coalition to which they belong; their institutional position, their position within public policy networks; their academic and professional paths, etc. On the other hand, such politico-bureaucratic configurations can be repositioned in structures specific to each of the countries studied, as well as in the center-periphery relationships deriving from them (federal or central State, federated State or decentralized structures). If institutional and water policies' innovations can be observed in some fields (learning processes shared by coalitions, recompositions in relations between actors encouraging the development of new solutions), other situations reveal a tendency toward "path dependency" (focusing the decision-making process in periods of water stress on technicist coalitions with a monopoly on expert resources in the water bureaucracy sector, which results in retaining existing approaches and marginalizing alternative solutions). The many scenarios revealed in the conflicts studied reflect the same problem, namely a crisis of a system based on the power of hydrocracies and their engineering expertise. Either the system survives by reinforcing itself, or it changes by incorporating other orientations and skills, or else, it leaves a room for alternative forces during the recomposition of coalitions. In the end, this collective research consisted in studying the variables impacting a wide variety of scenarios and, therefore, in attempting to understand the outcomes of the studied conflicts.

This project also contributes to the study of the impact of water conflicts on the "ecological transition" and the implementation of new public policy instruments designed to adapt to it. The observed conflicts can lead to the adoption of water policies better suited to the constraints imposed by the ecological transition when water crises generate a composition of coalitions that bring new skills to the table. Conflicts can also encourage the continued application of existing policies when recompositions of coalitions fail to provoke changes in shared beliefs or impact on the distribution of interests. The research process revealed a problematic characteristic of all the case studies, namely that, whatever the outcome of water

conflicts, the questioning of the megaprojects and major infrastructures (dams, canals, etc.), of the expertise required for their implementation, and the water bureaucracies steering them, shows to what point uncertainties caused by the effects of the ecological transition affect the way of conceiving the water management modes. The new protagonists of the water sector are no more limited to associations nor NGOs, but now encompass water administrators and professionals at various levels of management, be it local or international, with links to the State level. Beyond the requirements of transparency and participation, these new water protagonists also advocate alternative policies, the ecological orientations of which are clearly affirmed. One of the perspectives opened up by the project is to allow an analysis of the conditions of emergence of a process of ecologization of water policy, particularly the implementation of conservation policies, which are not only supported by environmentalist movements alerting on the "ecological transition", but also promoted at various institutional levels by "decision-makers" concerned with reconciling economic development with the conservation of water resources and ecosystems.

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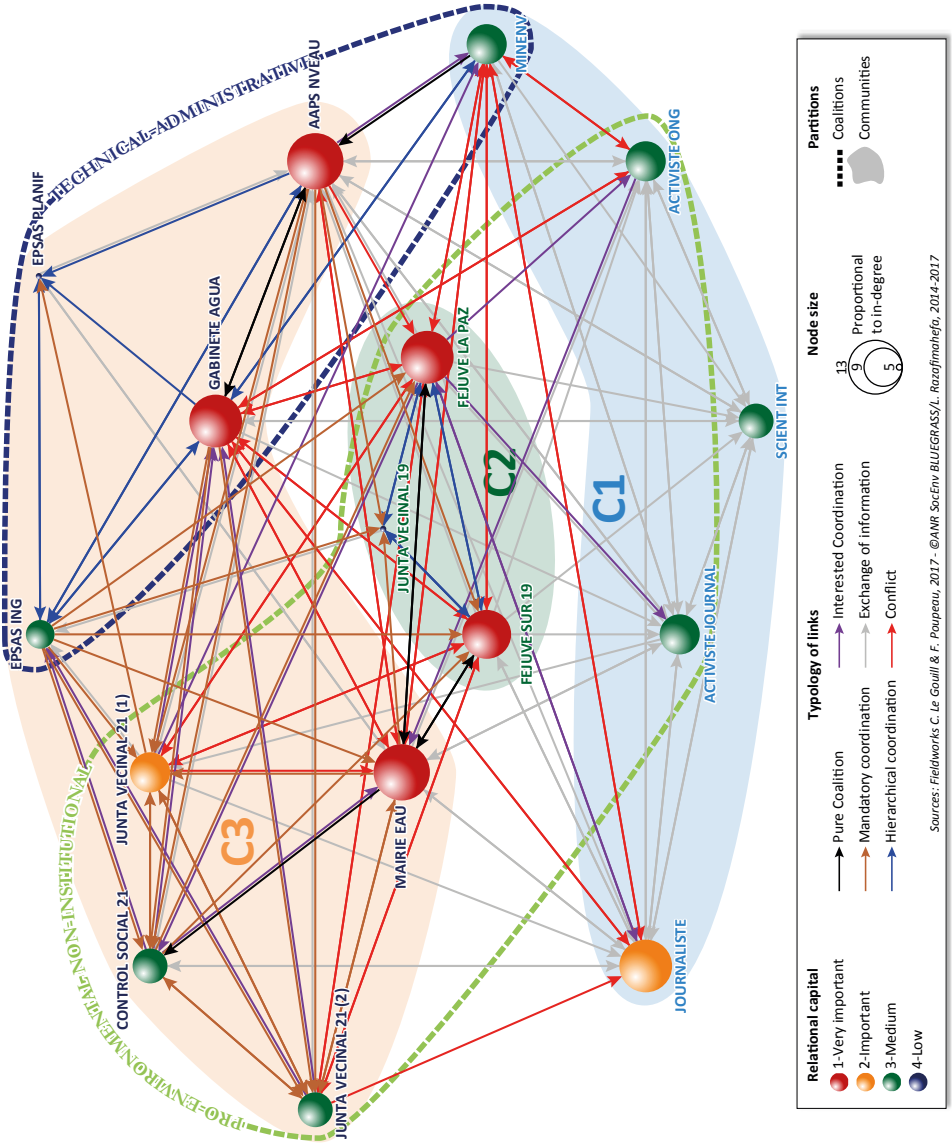

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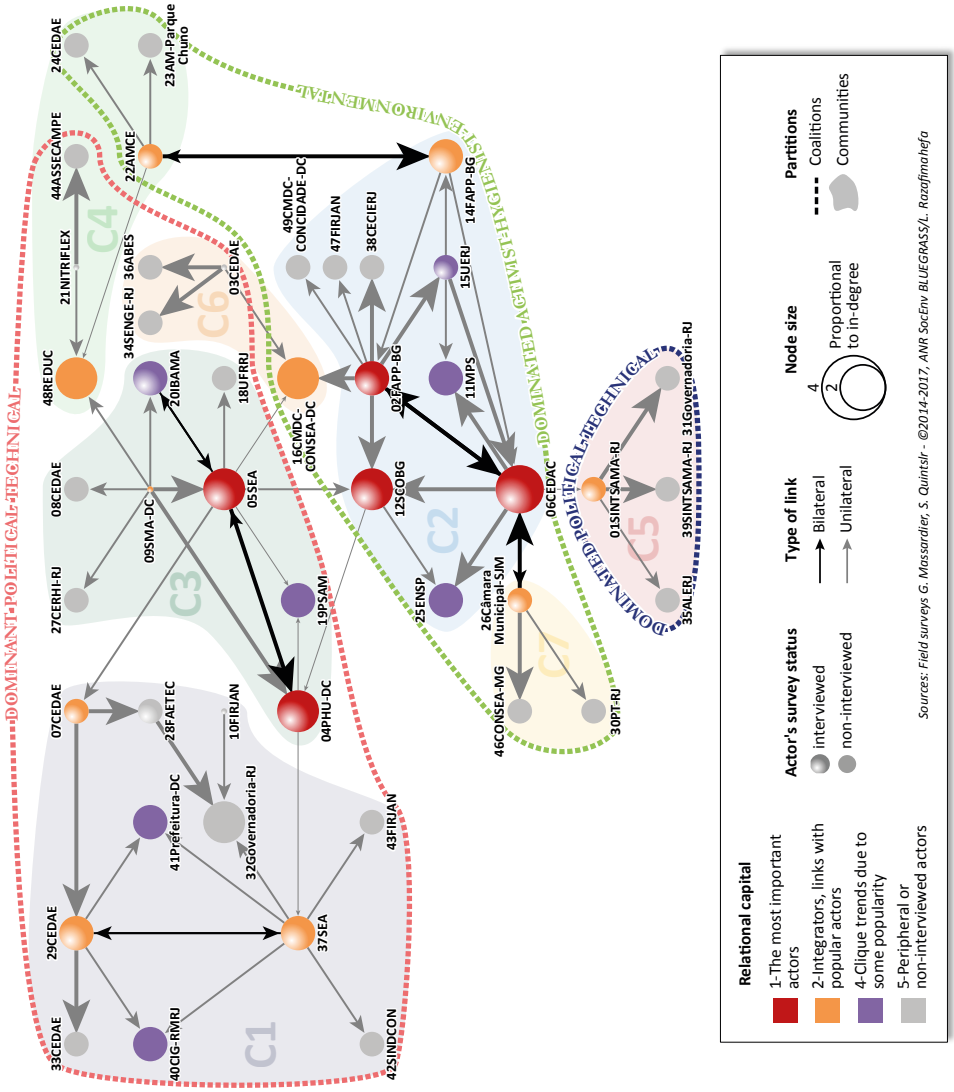

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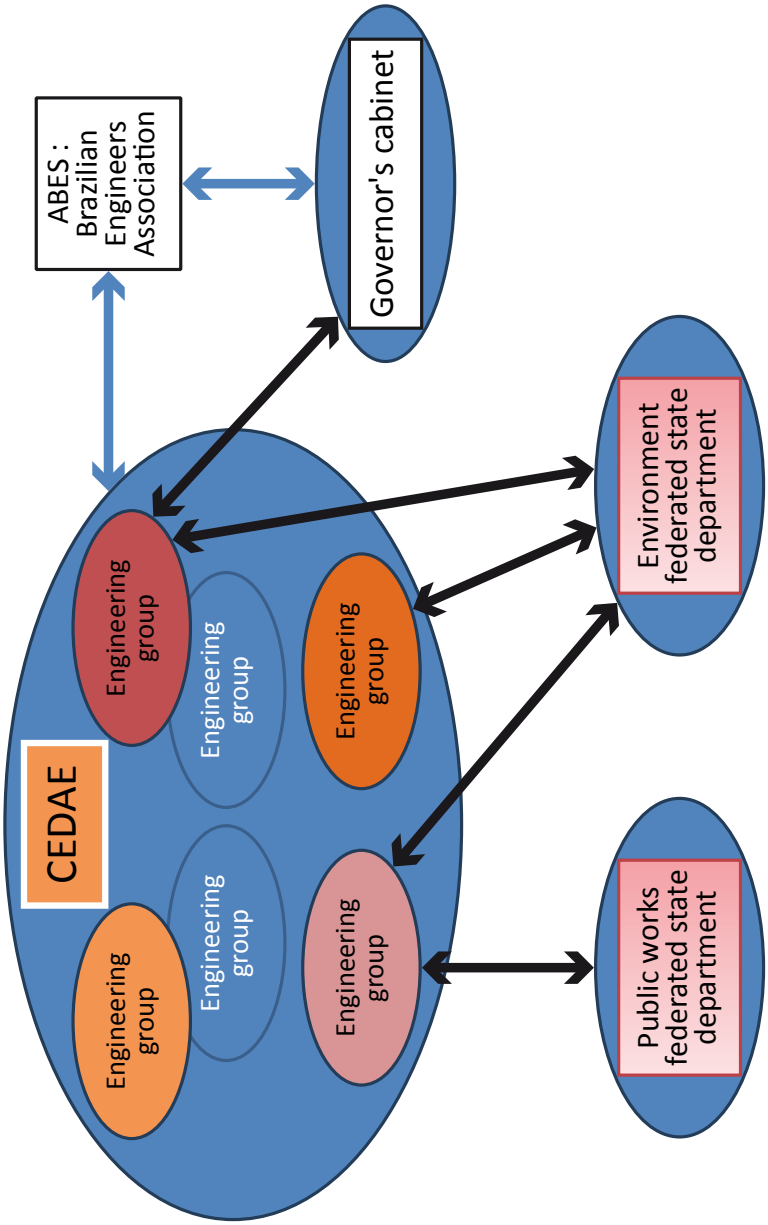

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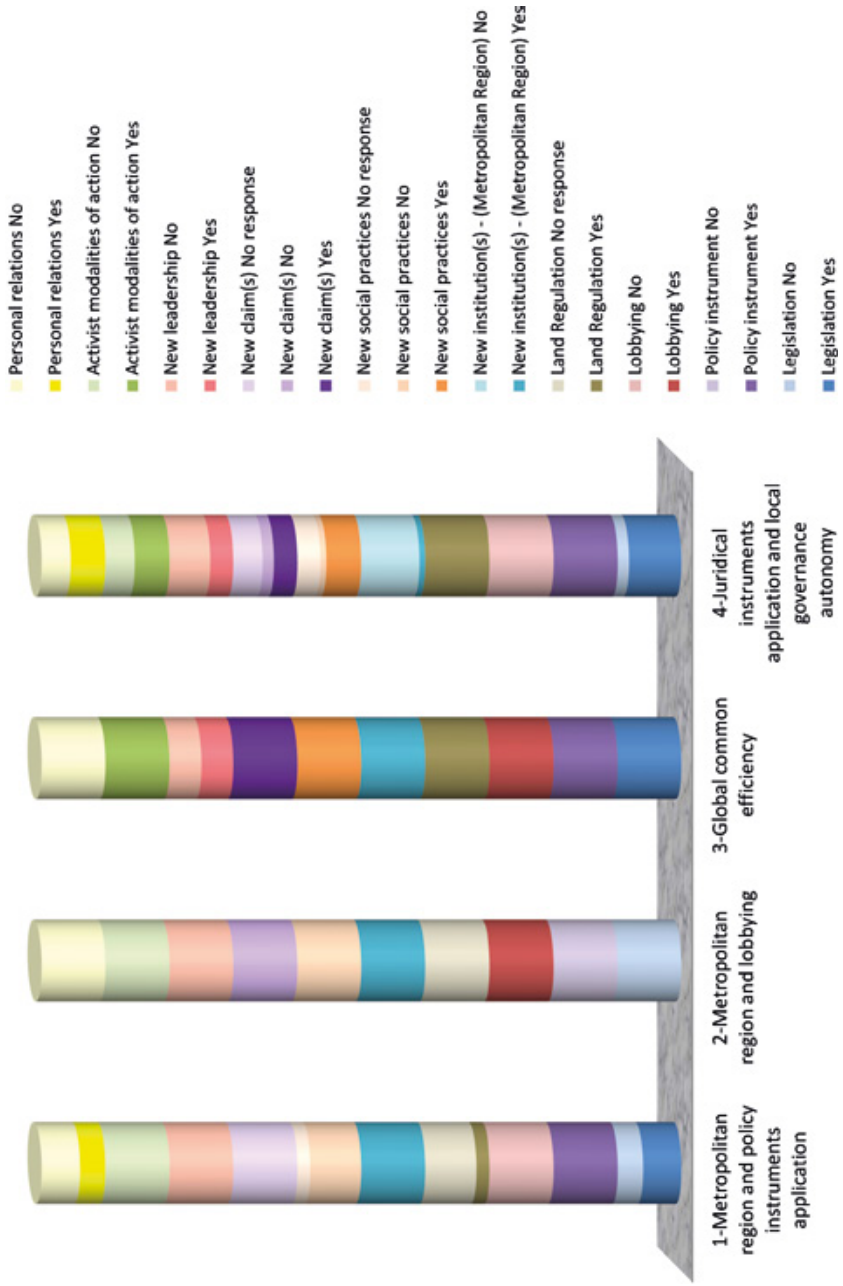

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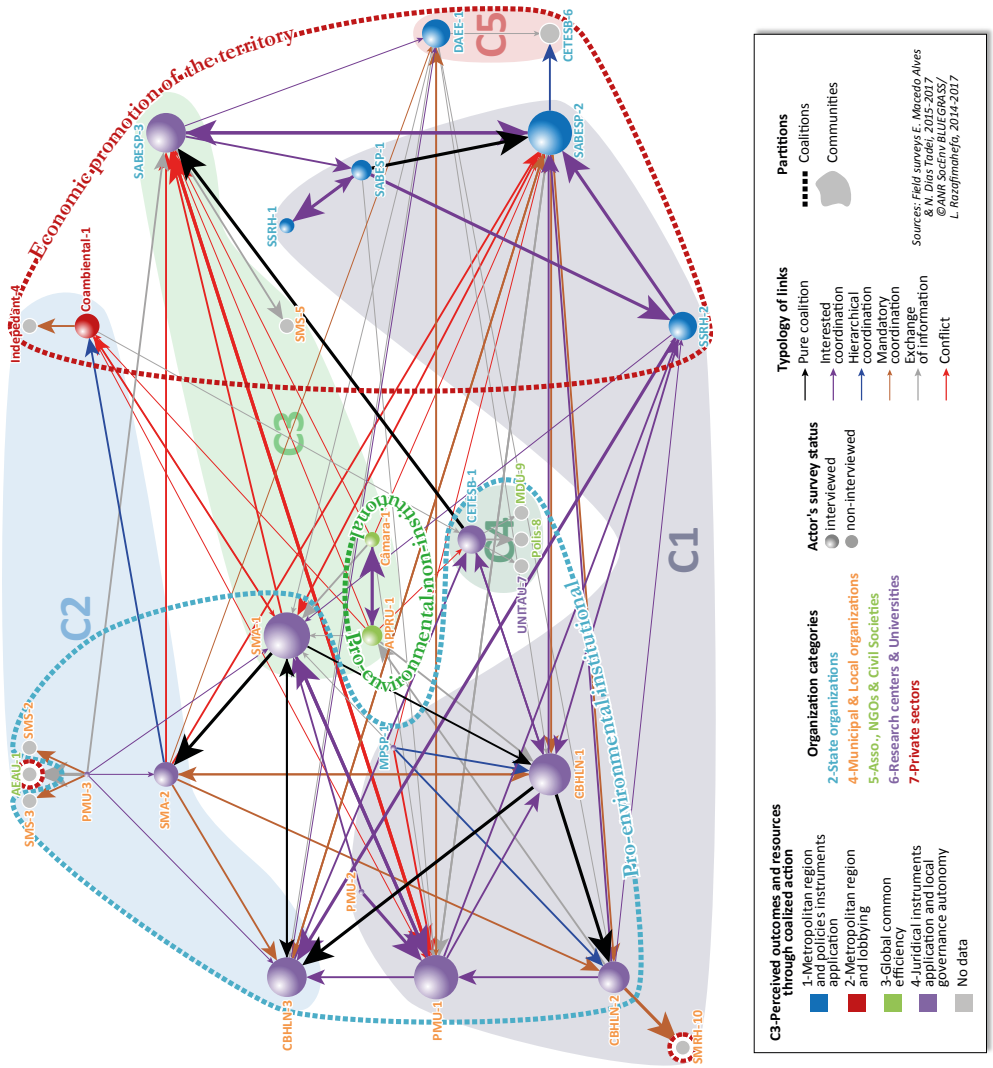

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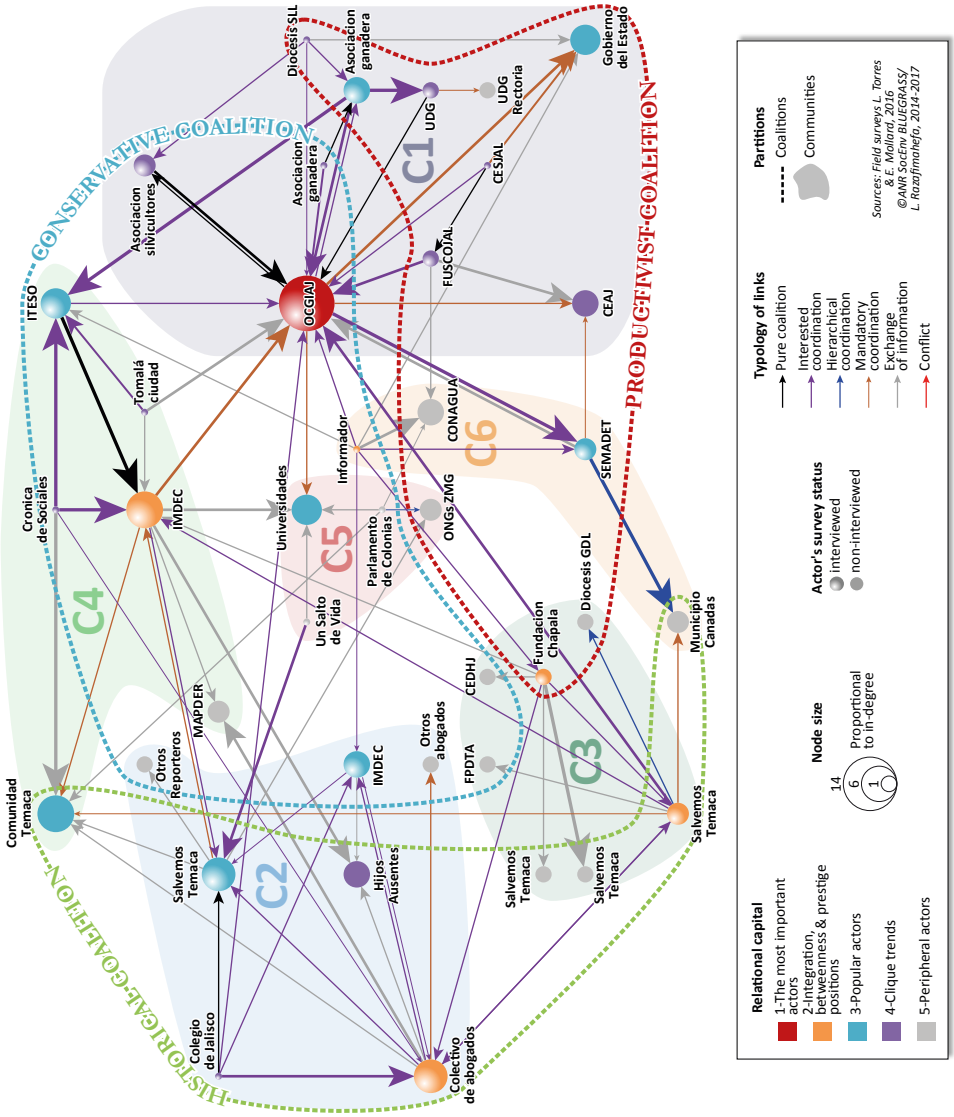

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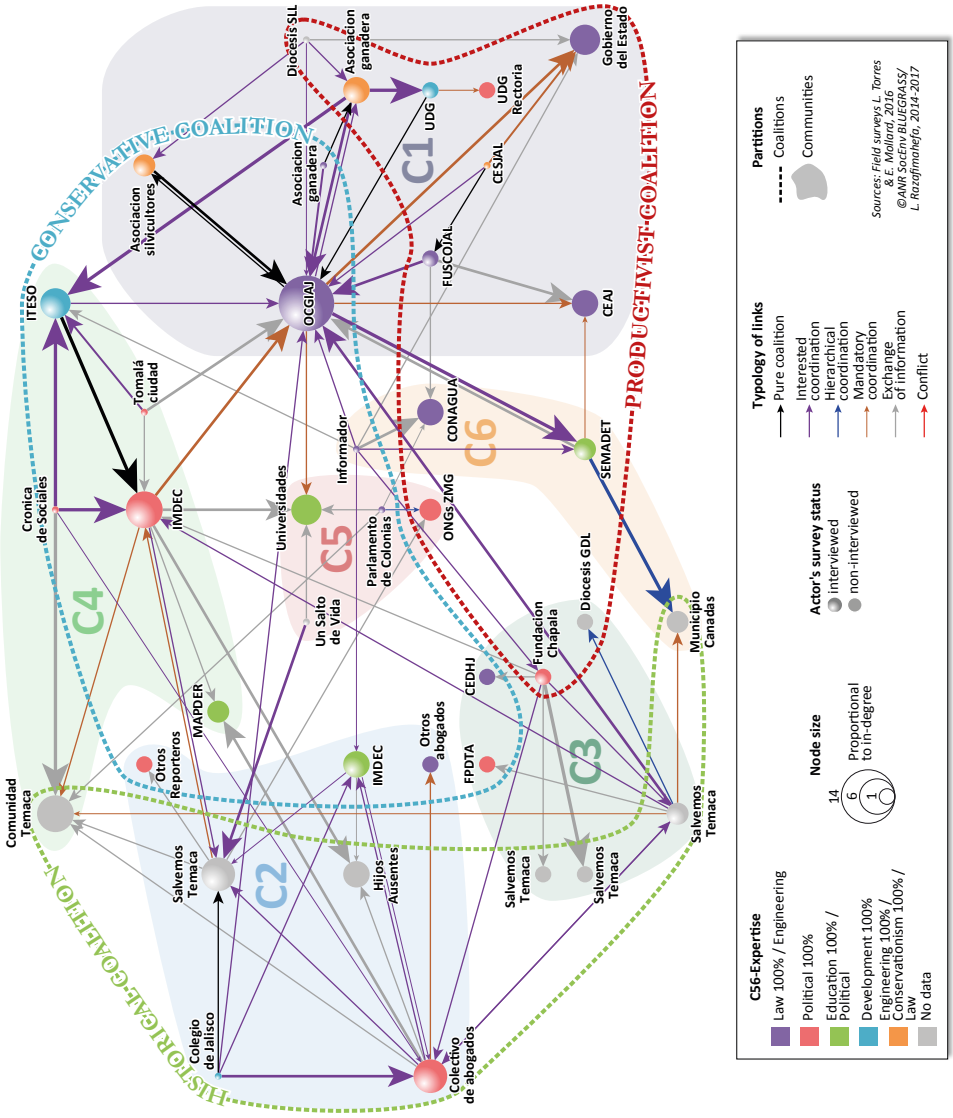

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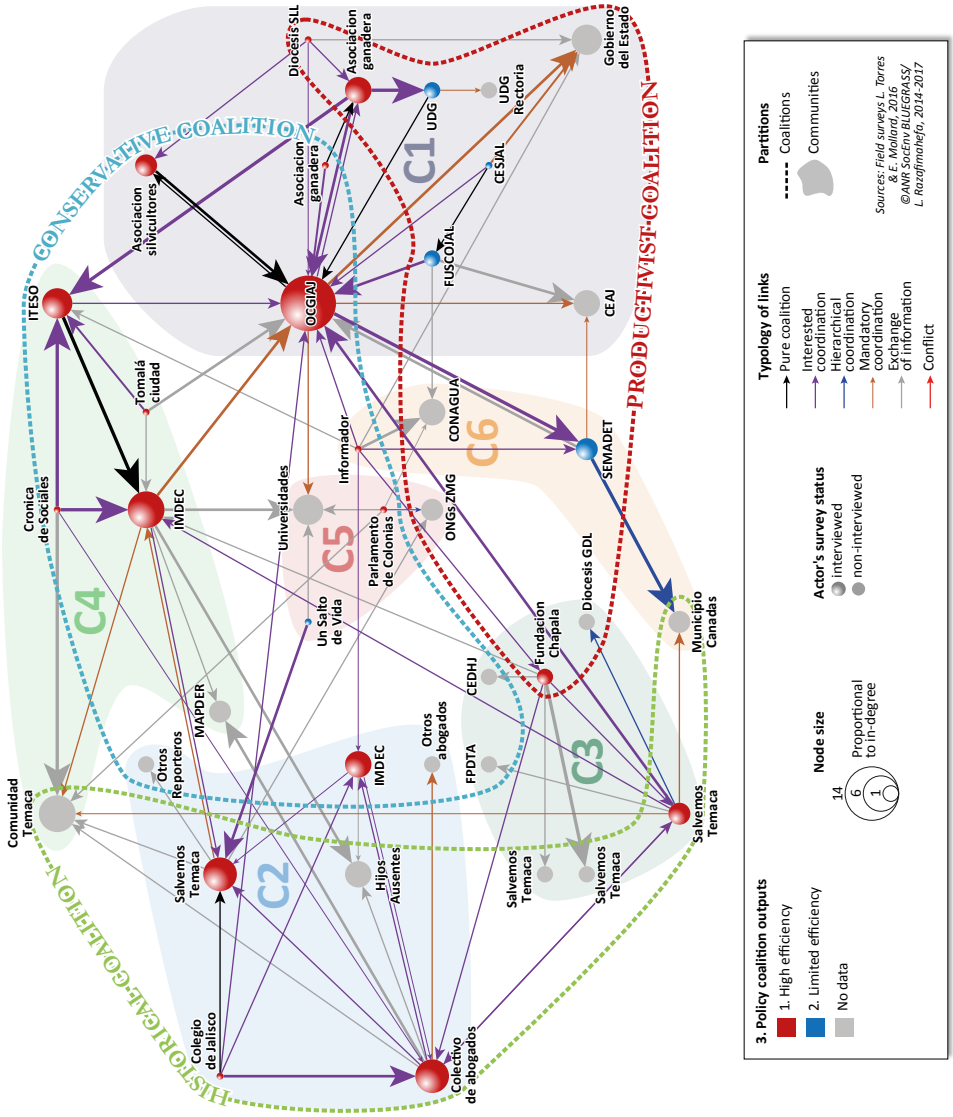

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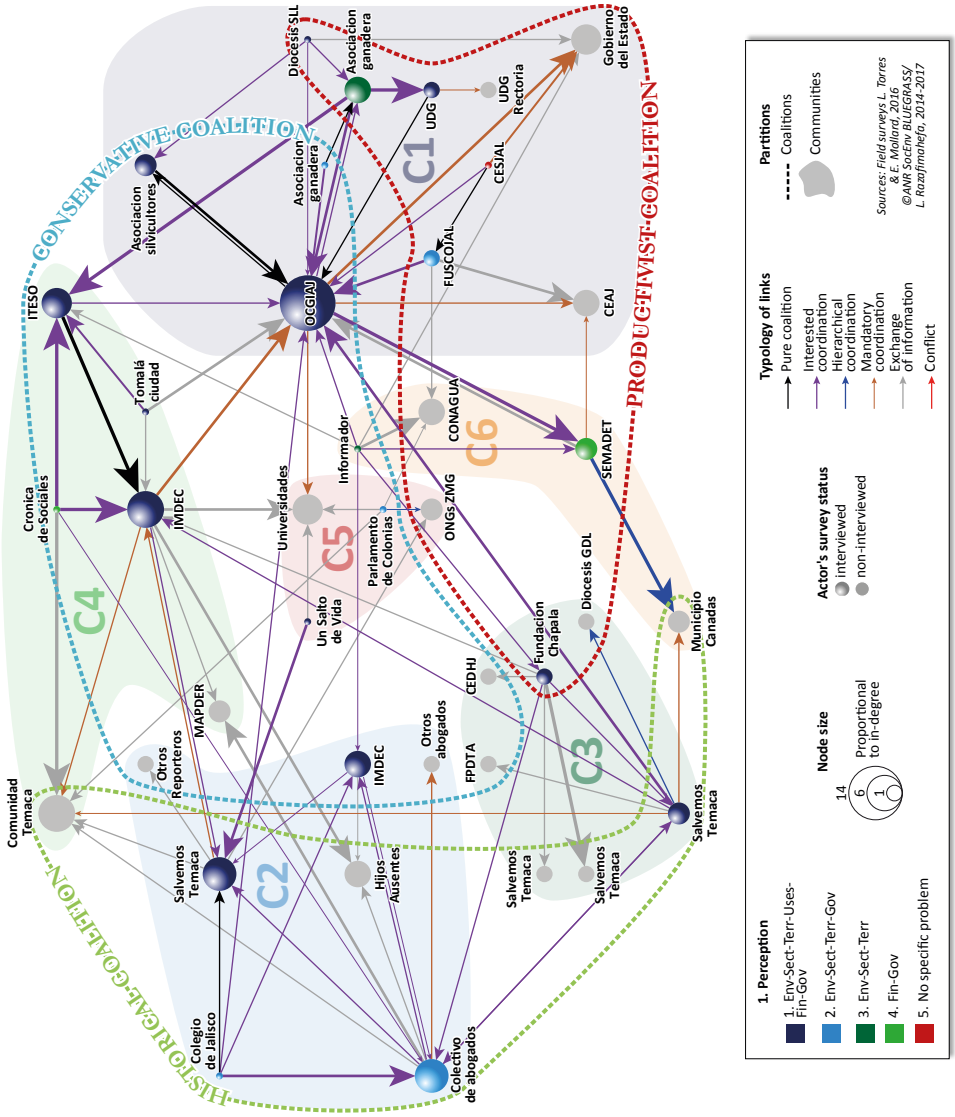

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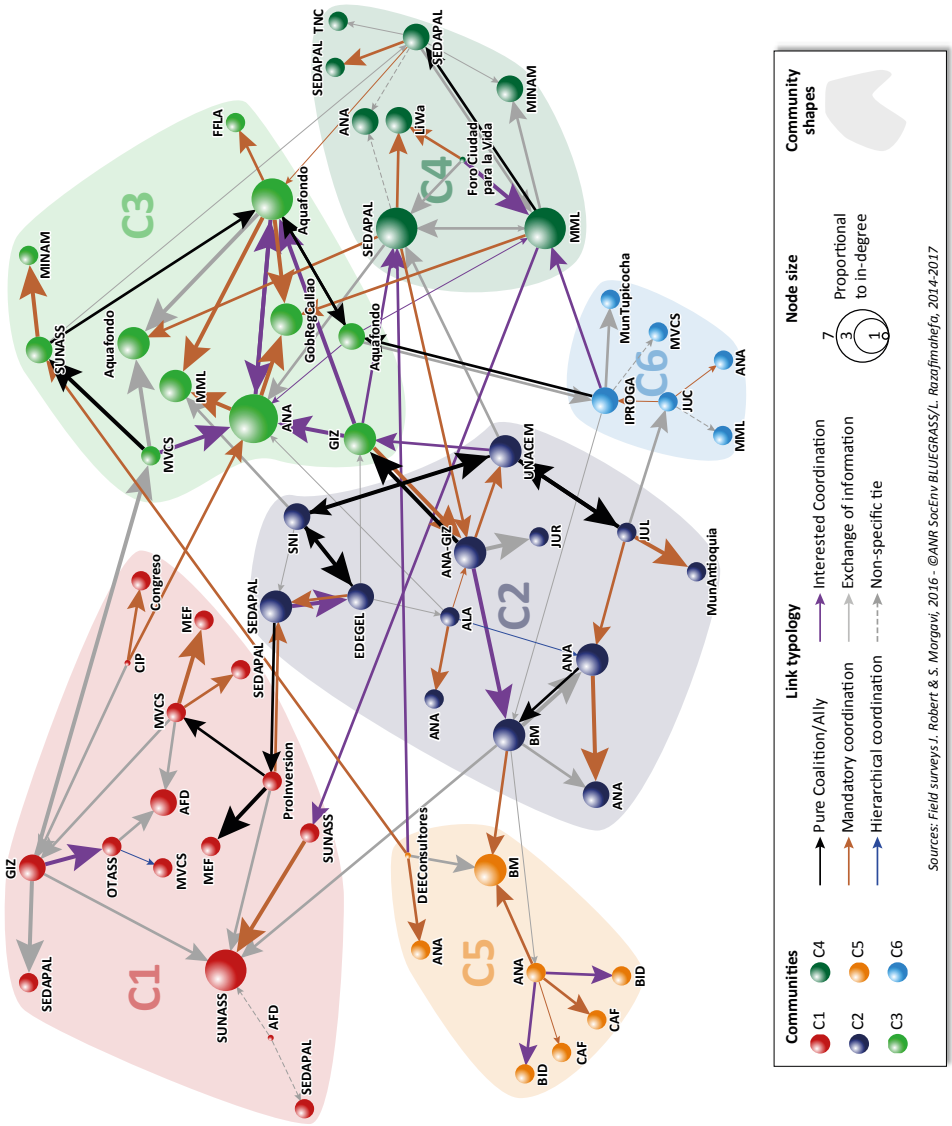

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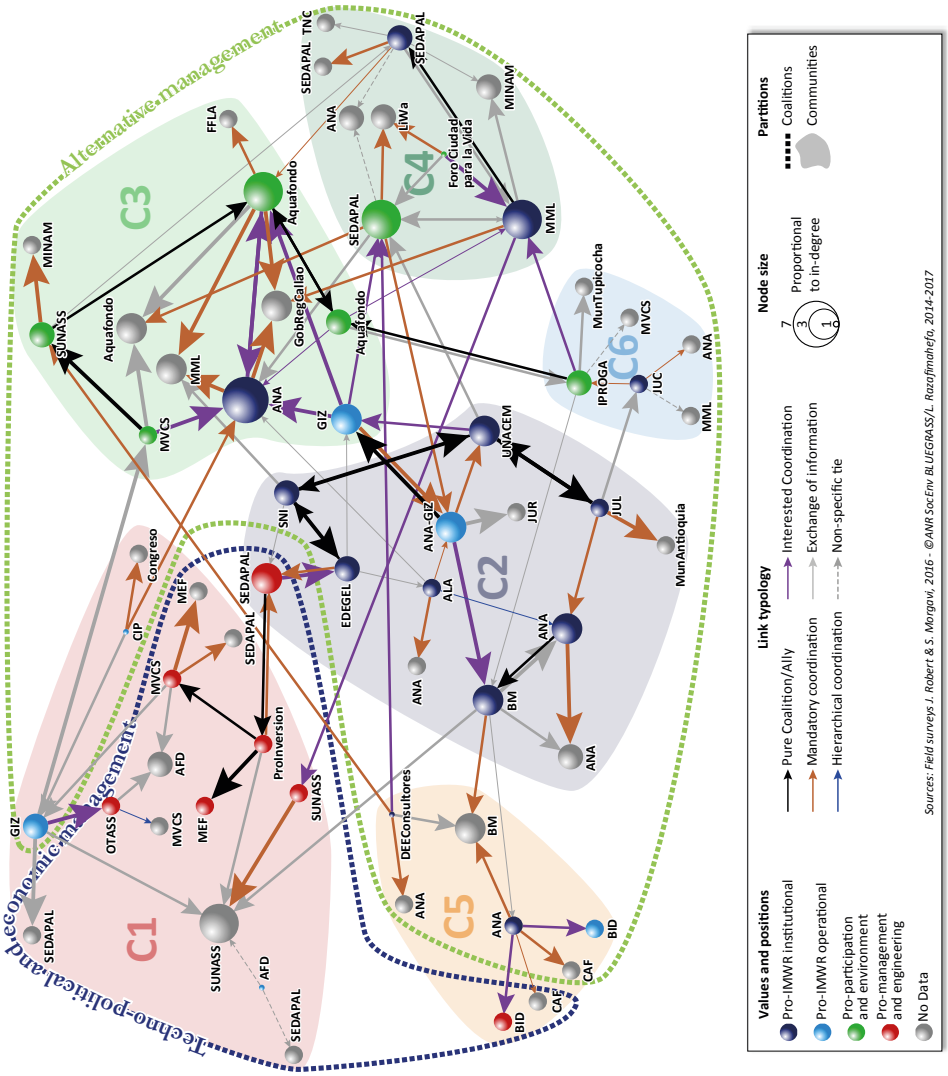

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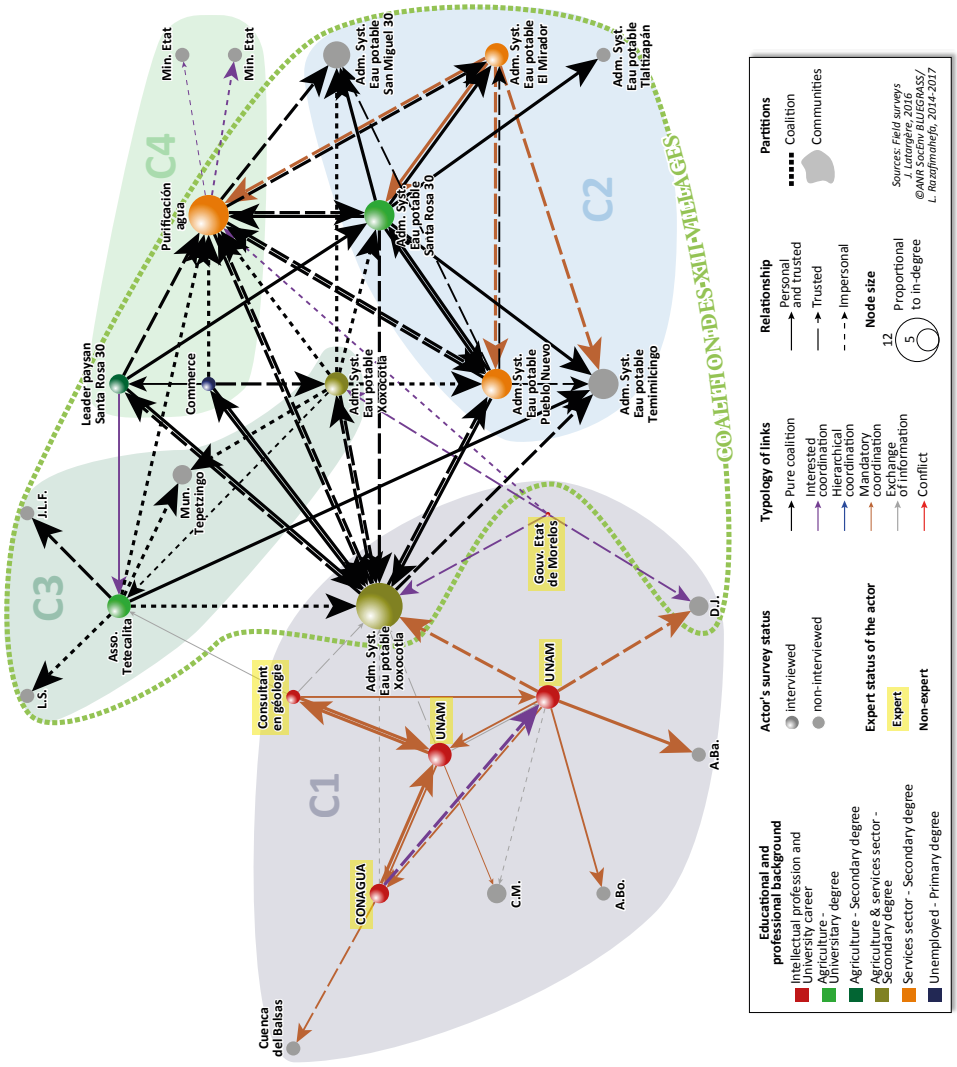

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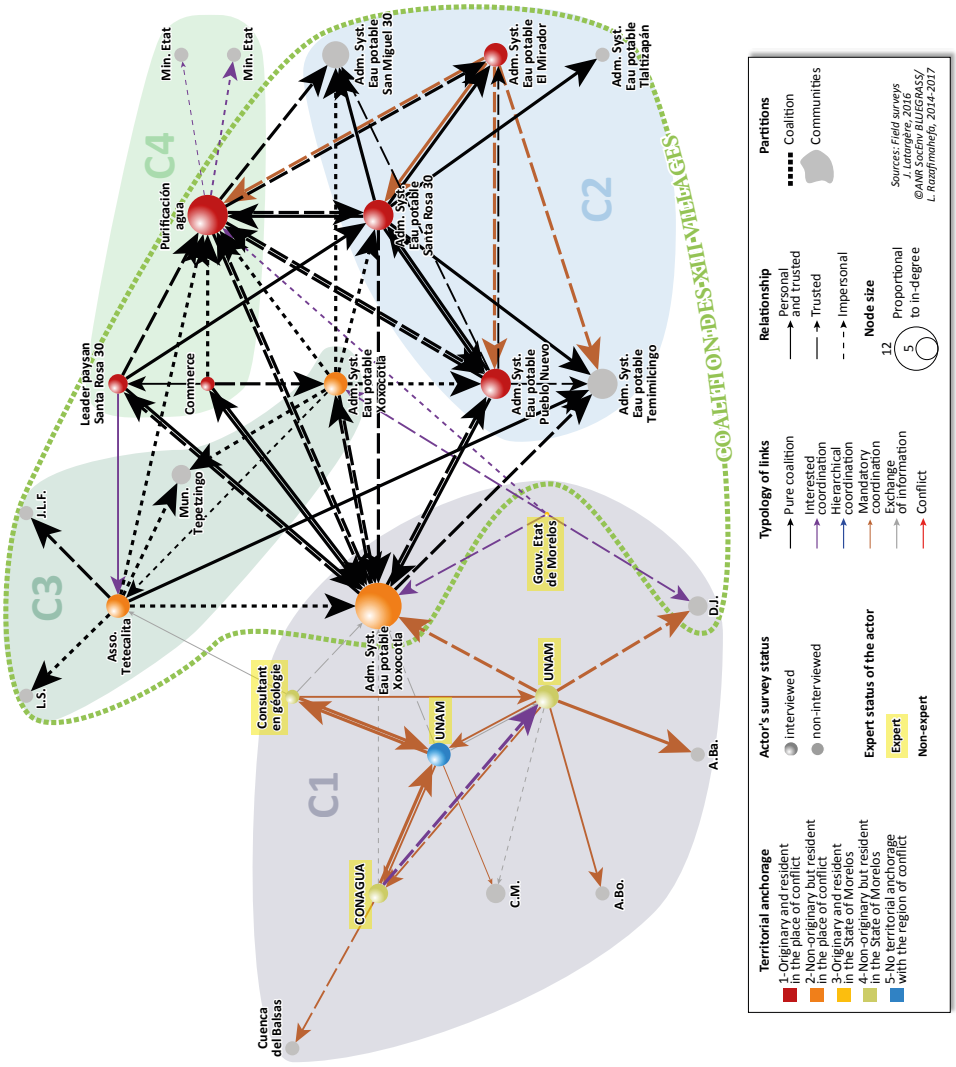

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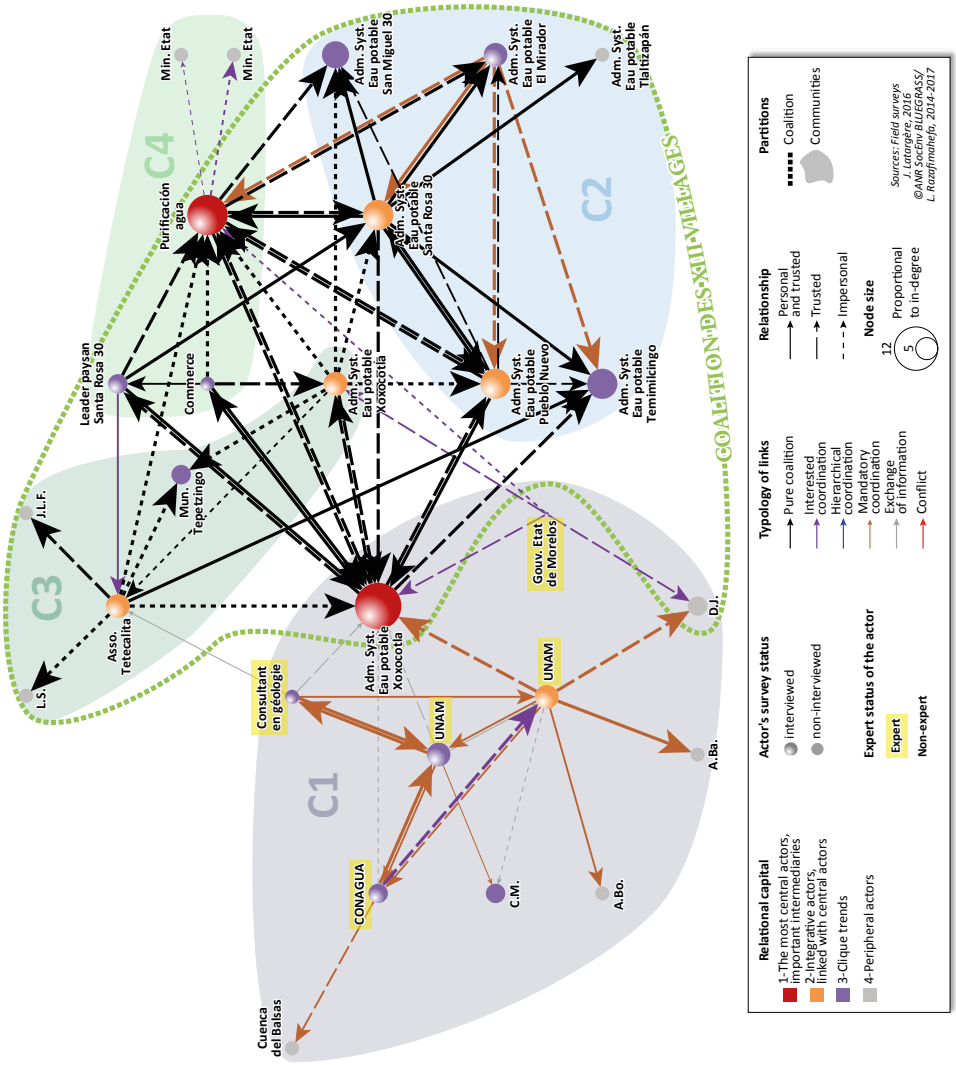

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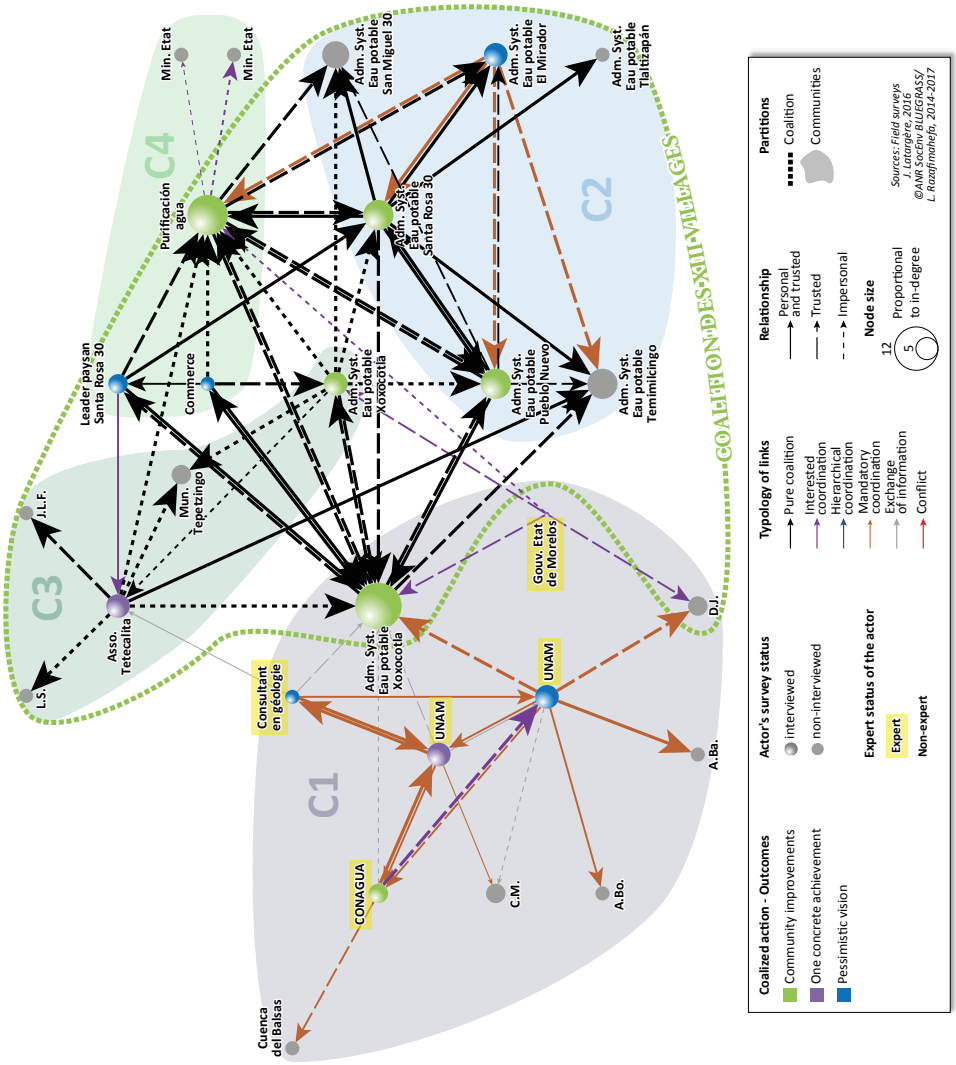

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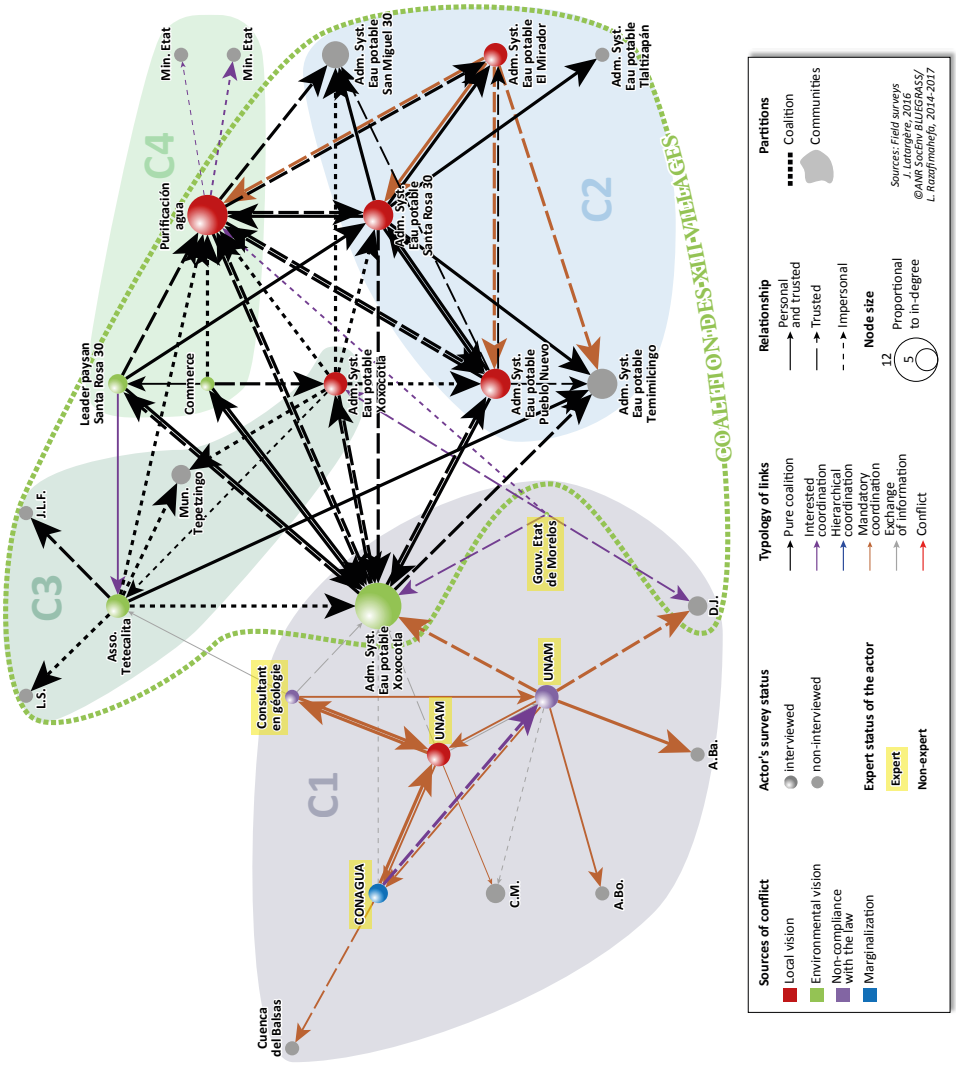

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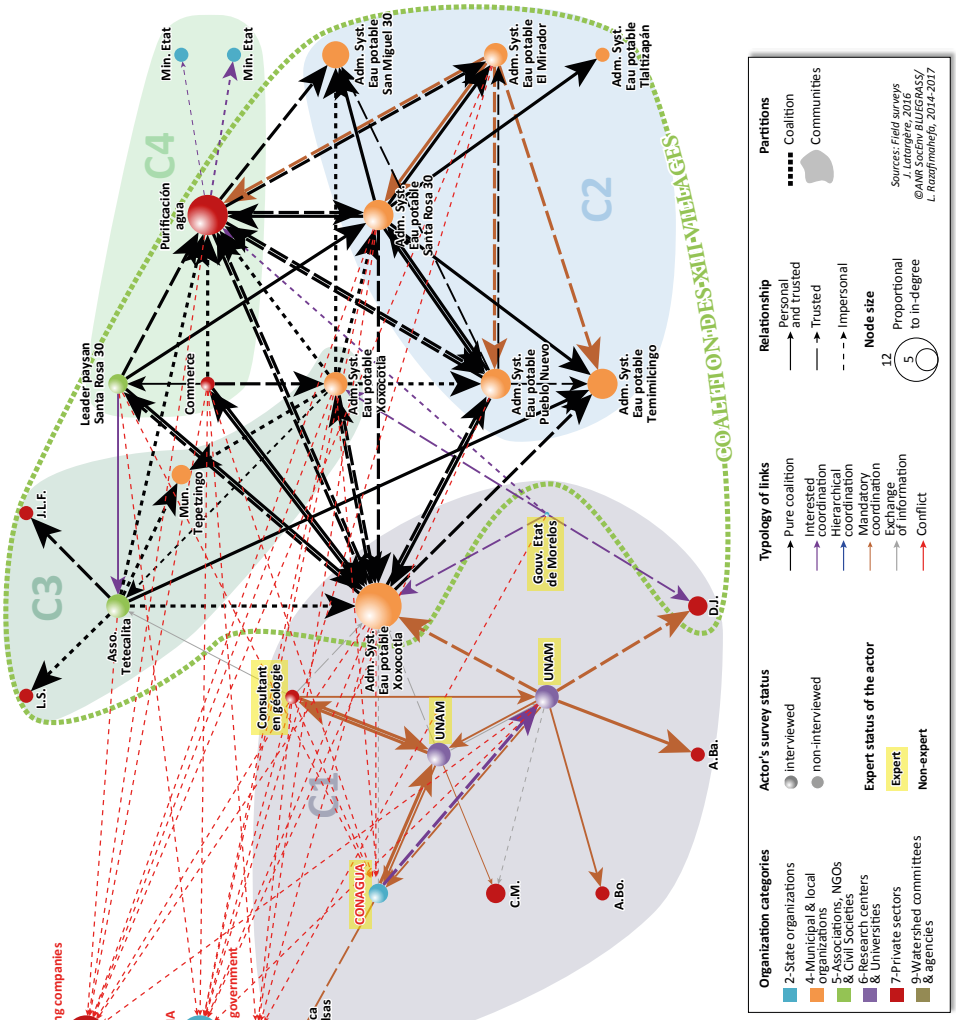

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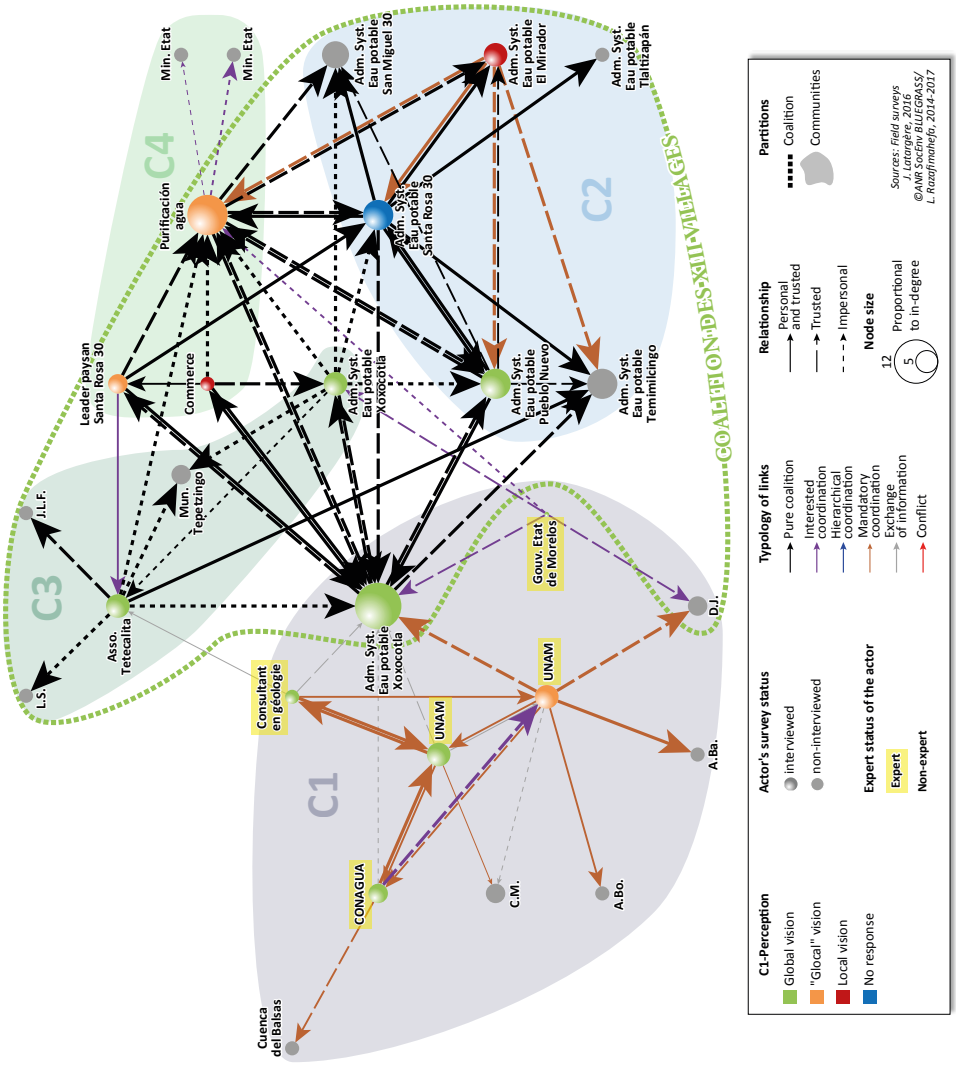

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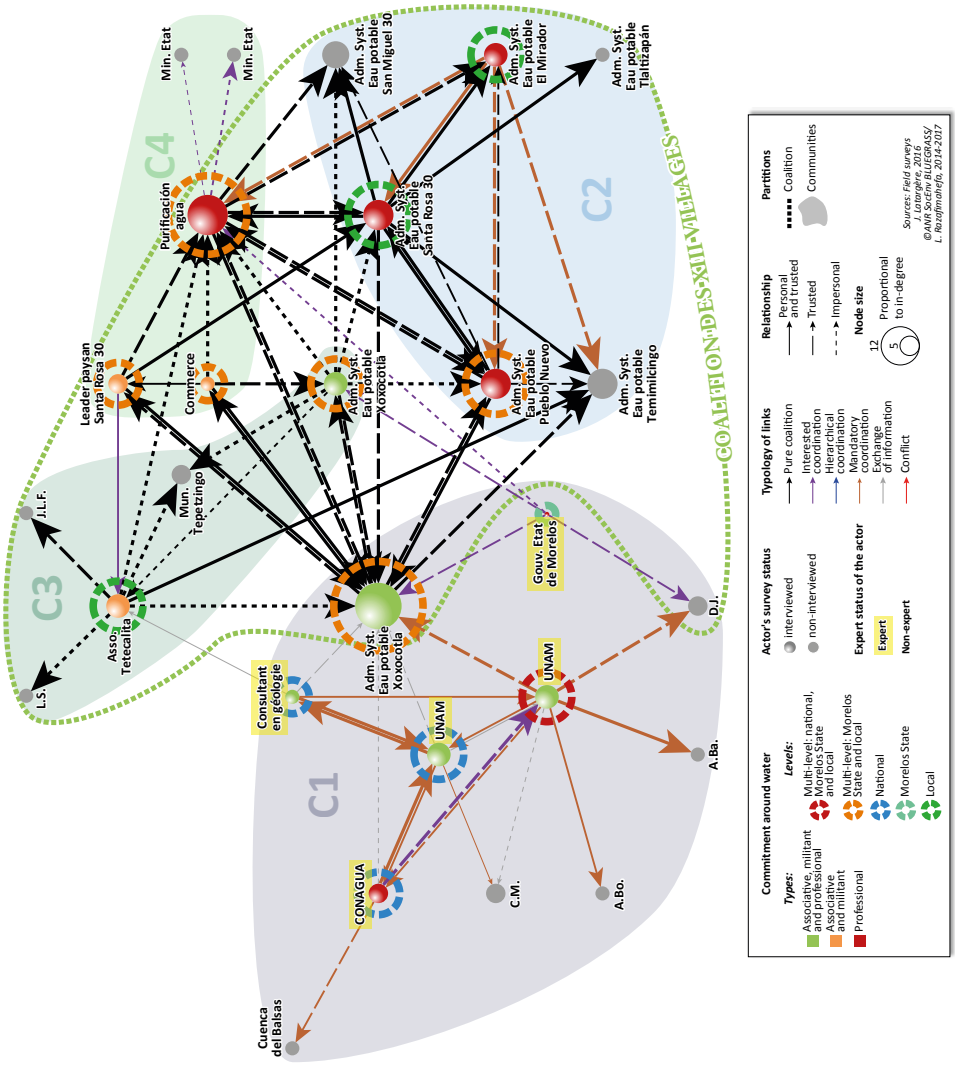

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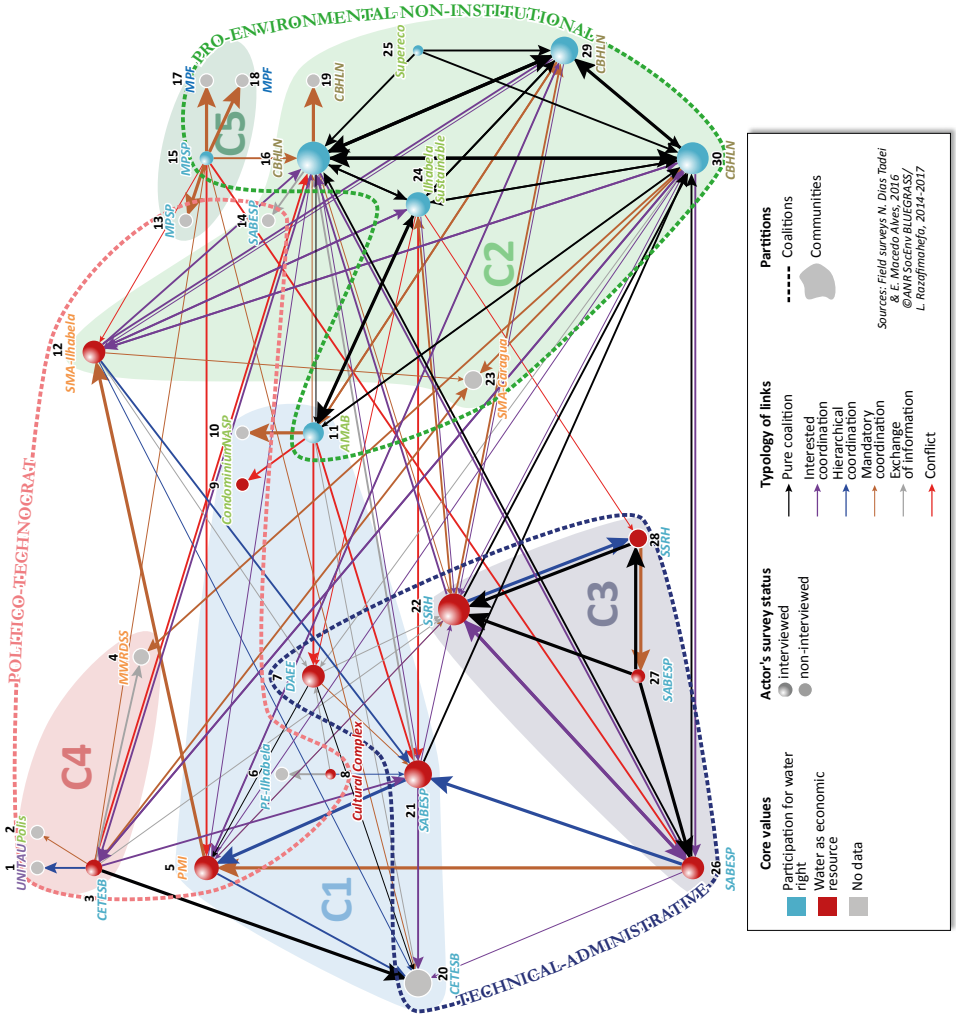

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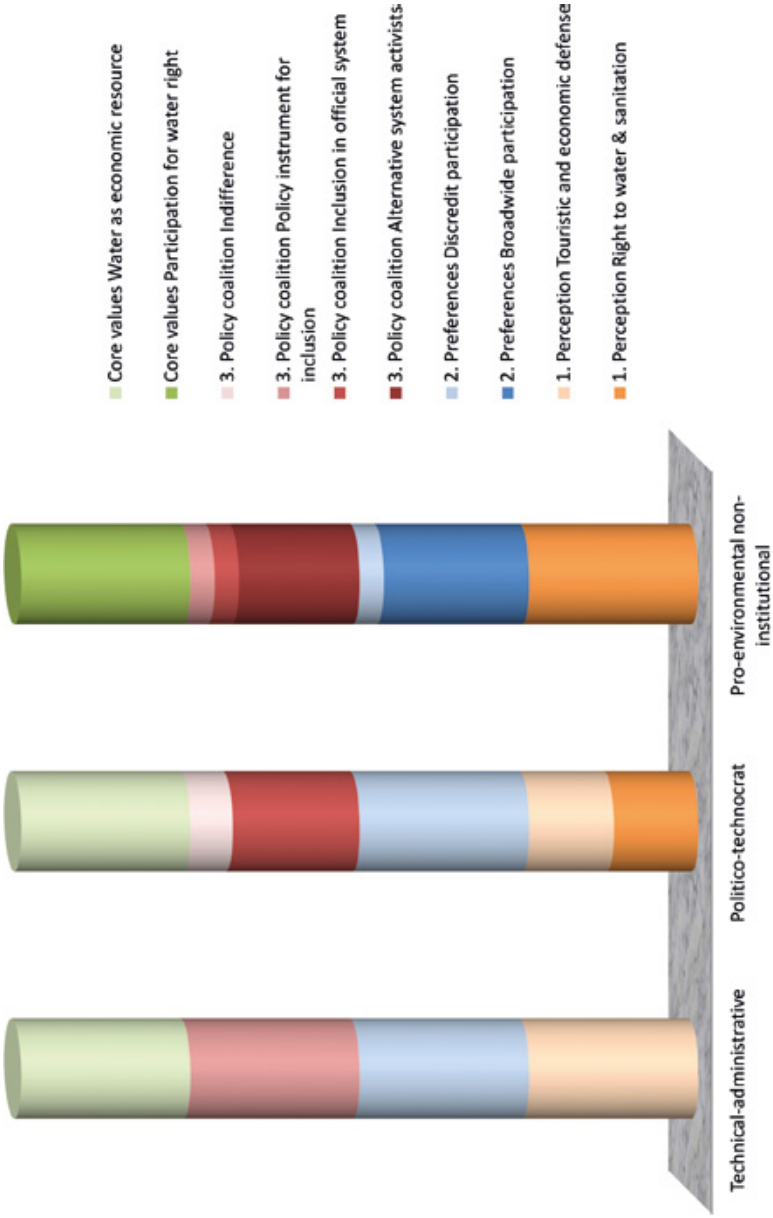

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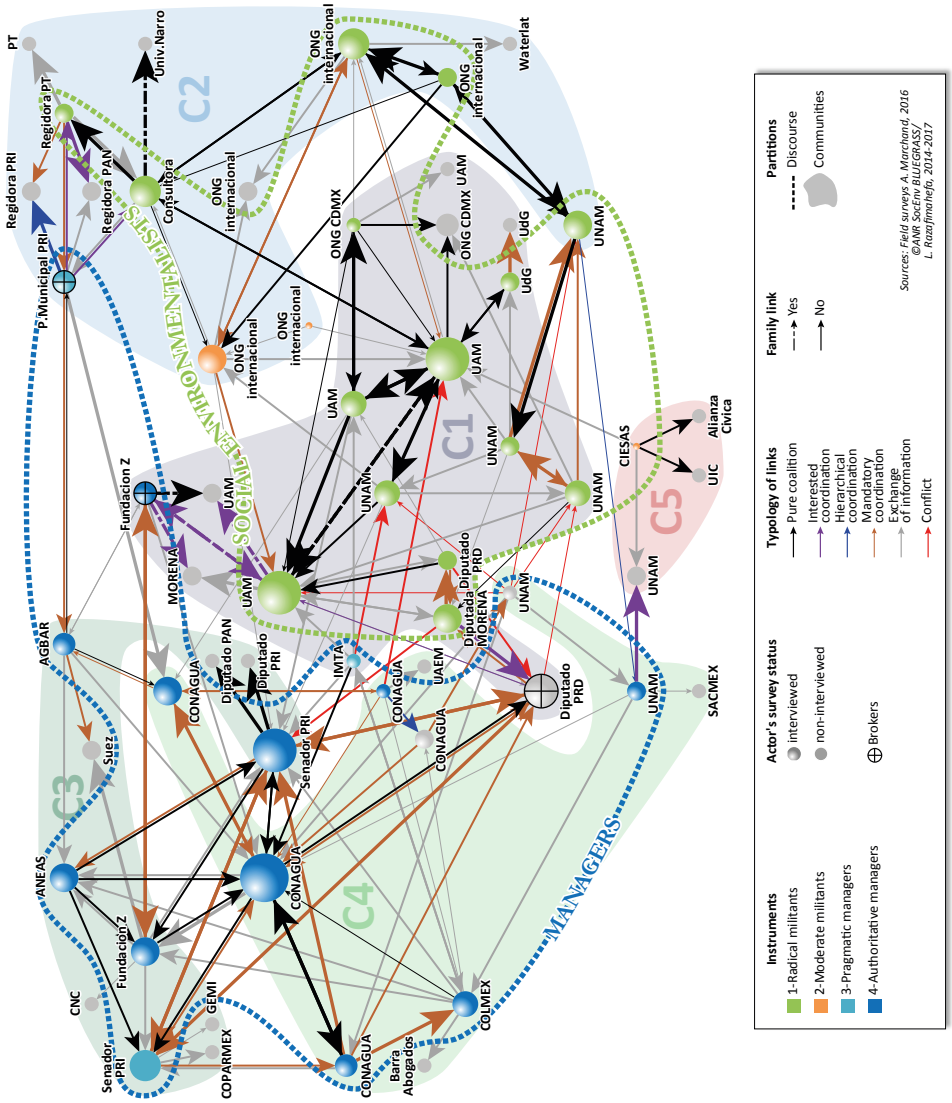

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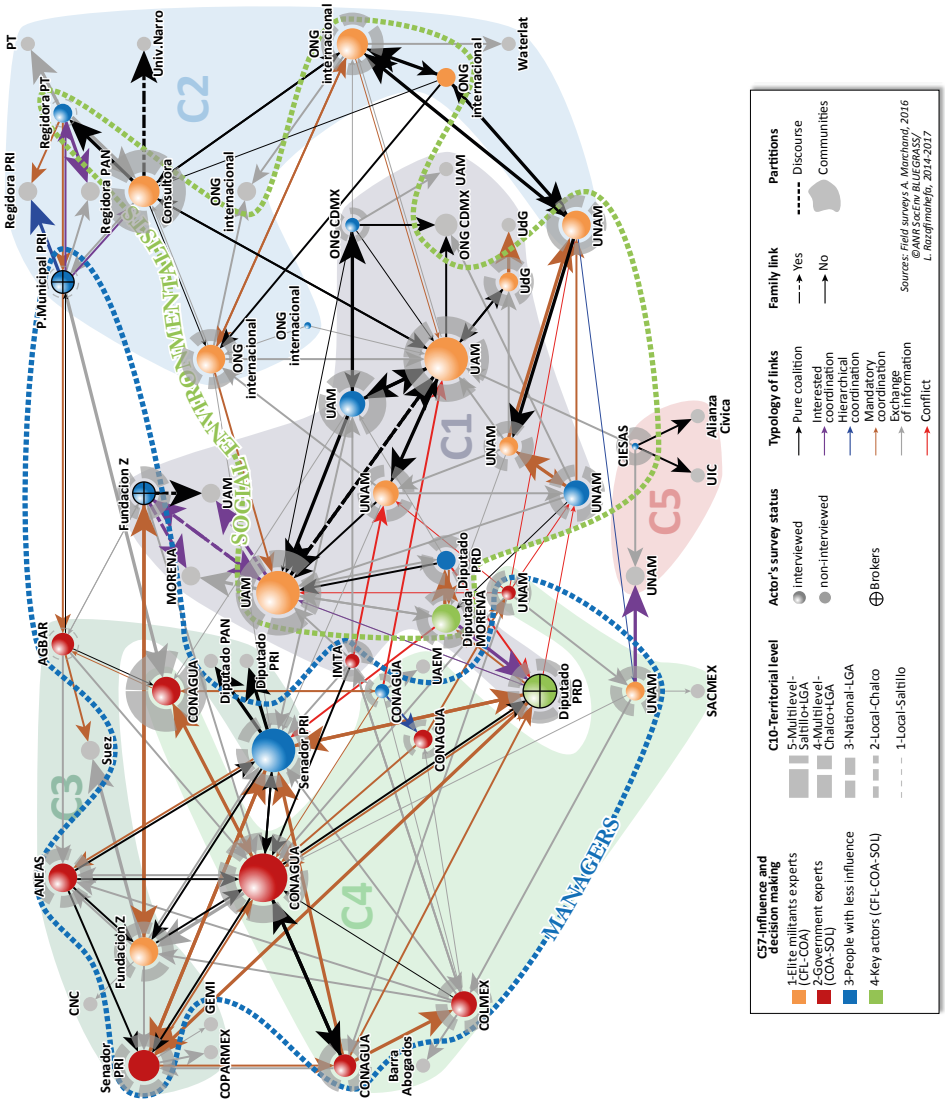

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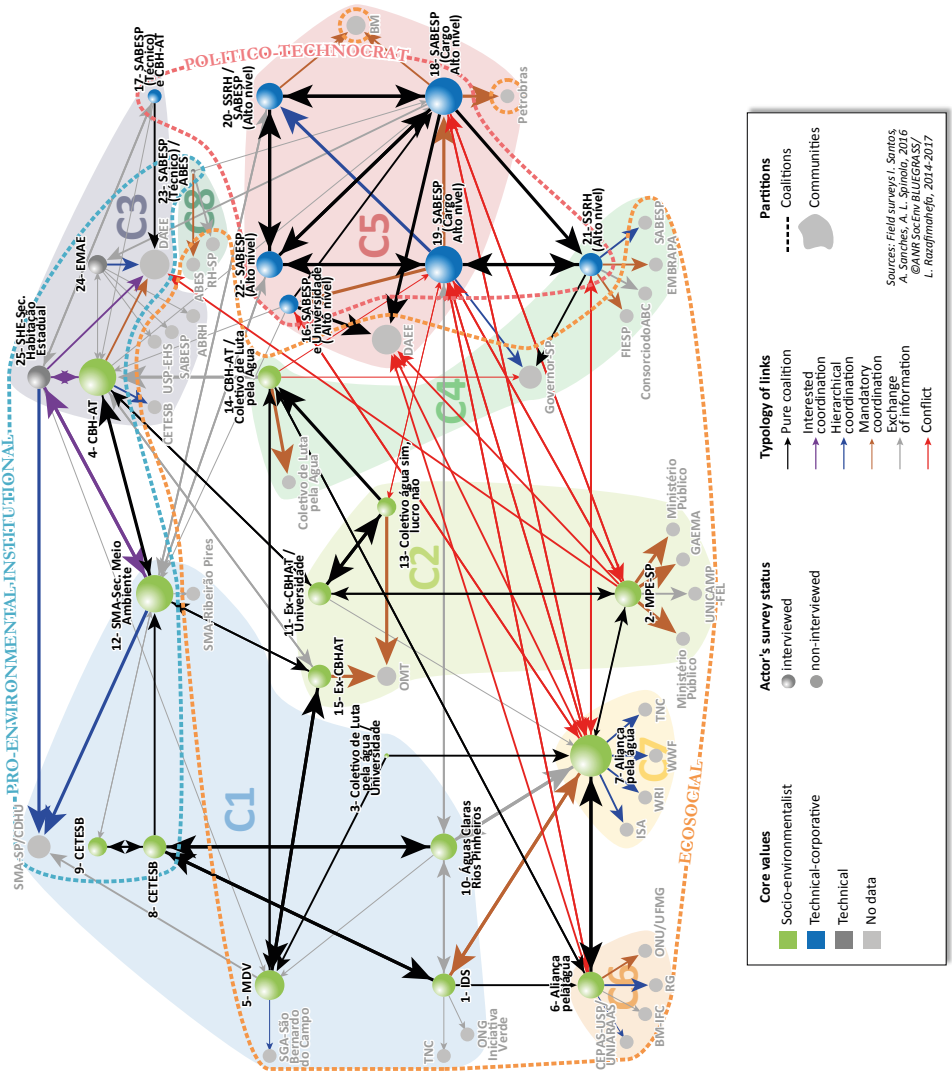

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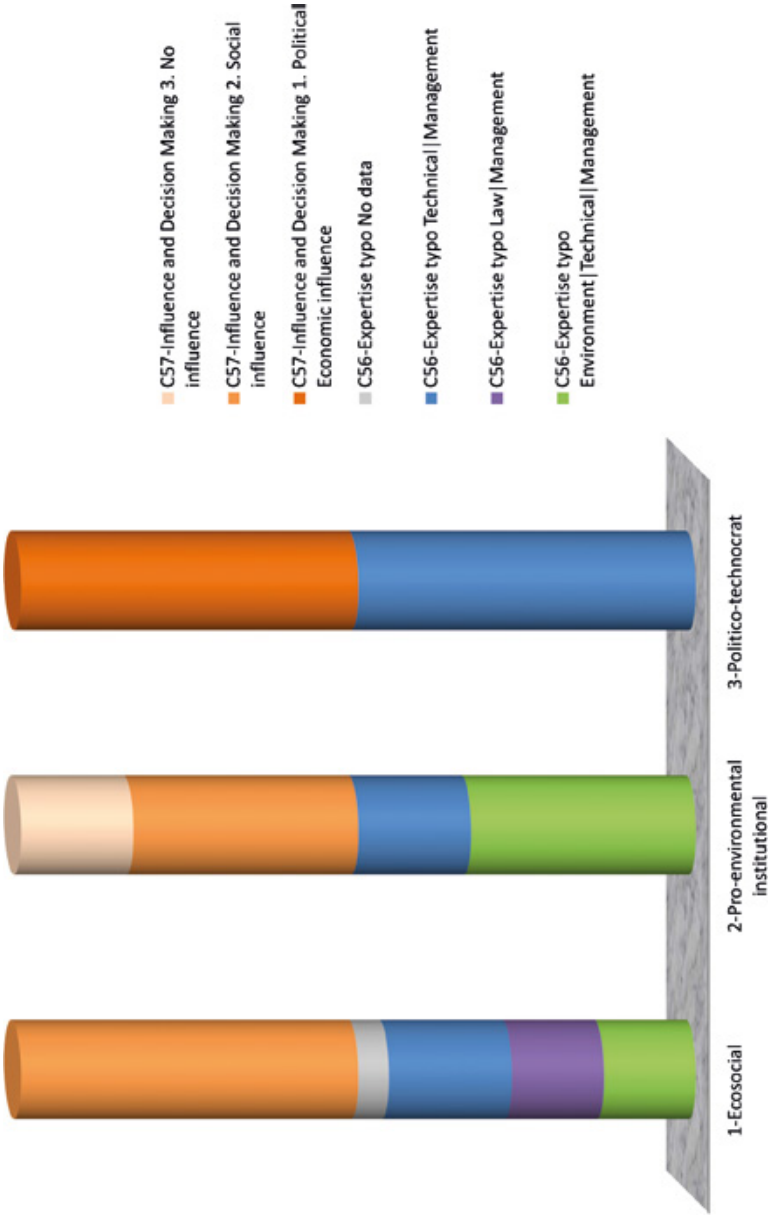
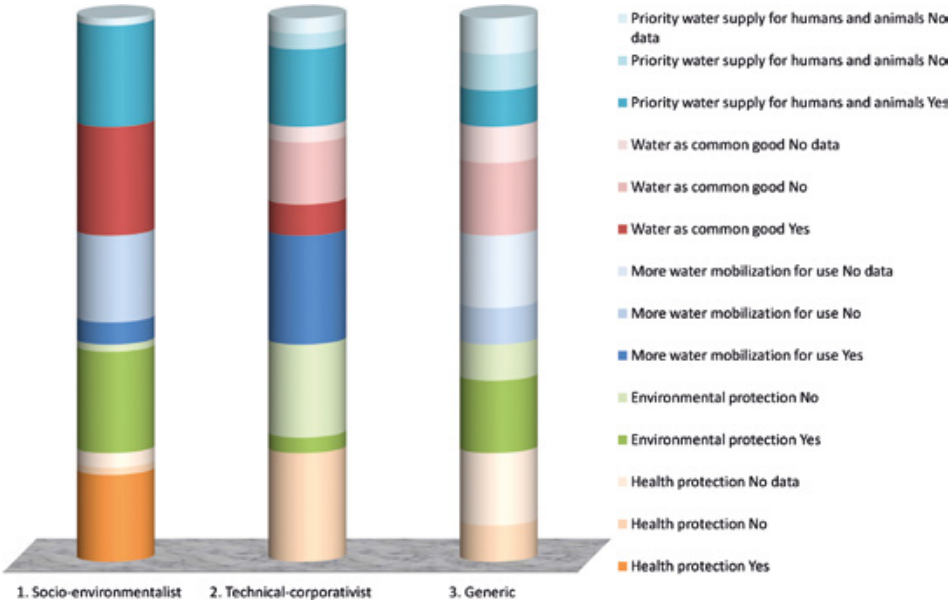
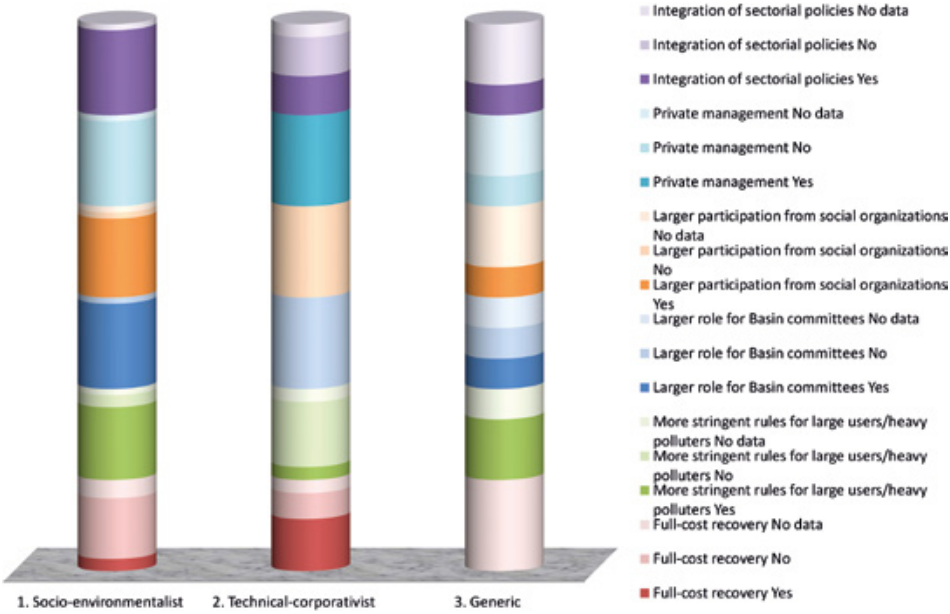


Figures 9.4a & 9.4b. Political principles and priorities (a) and political content (b) taken into account to formulate the core values groups, p. 286





Chapter 10. Reinventing water conservation

Figure 10.1. The structure of the network: institutions and water policy objectives , p. 304

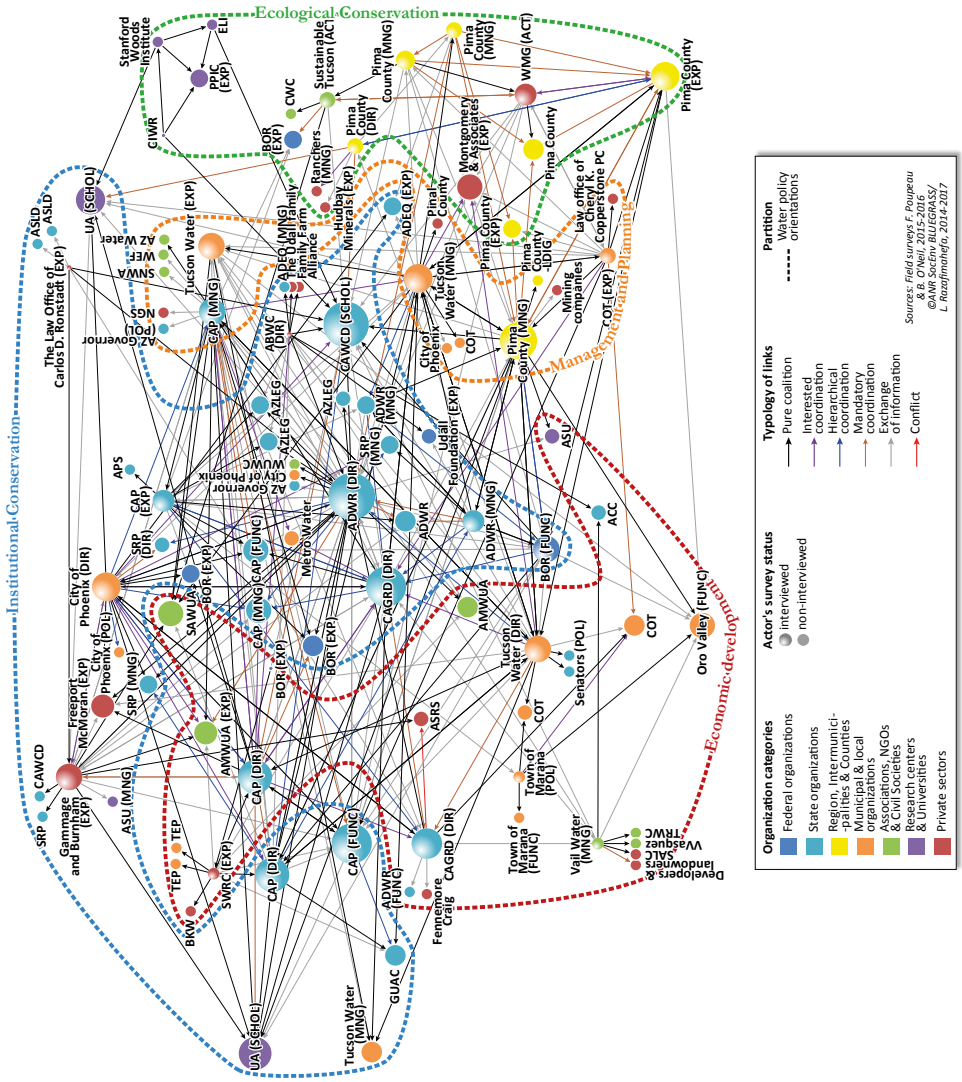


Figure 10.2. Educational background and implementation of the conservation coalition , p. 312

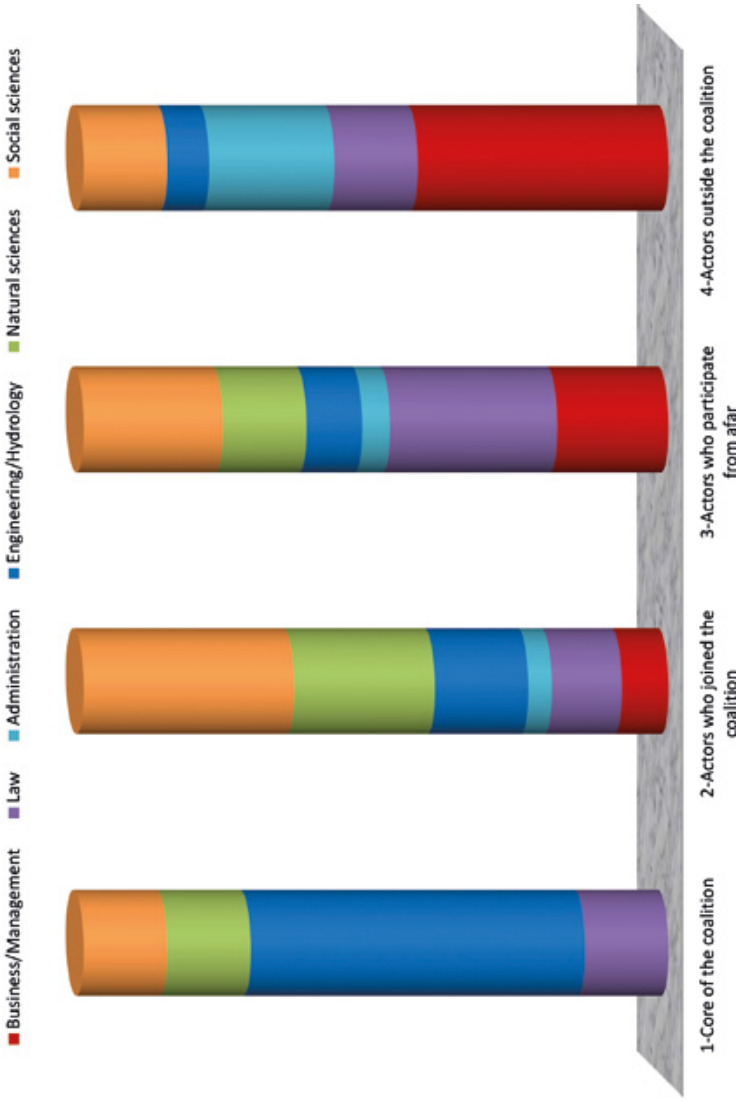
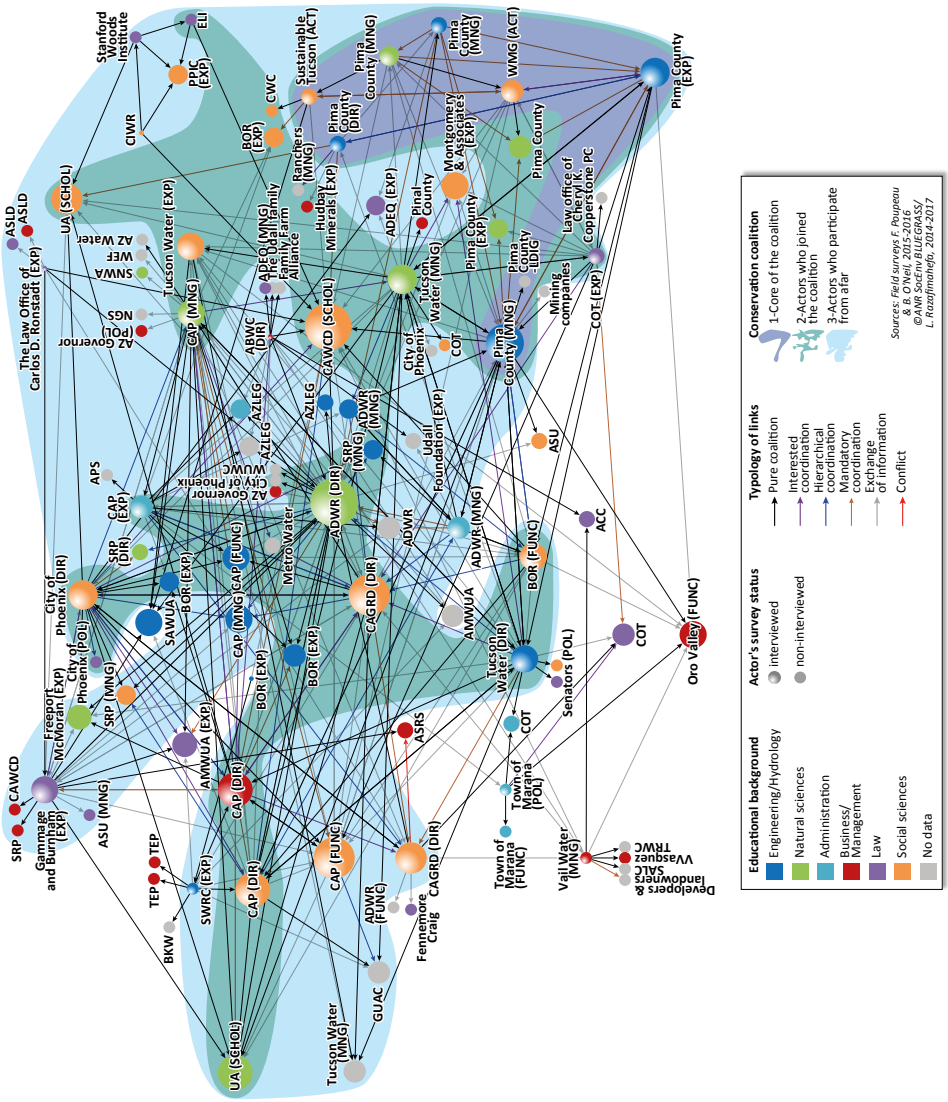


Figure 10.3. Educational background and conservation coalition, p. 313



Chapter 11. A controversy's relational approach

Figure 11.1. – Stakeholders' graph, p. 336
Color of the node: Modularity; Size of the node: Centrality;
Blue arrow: relationship flagged as personal

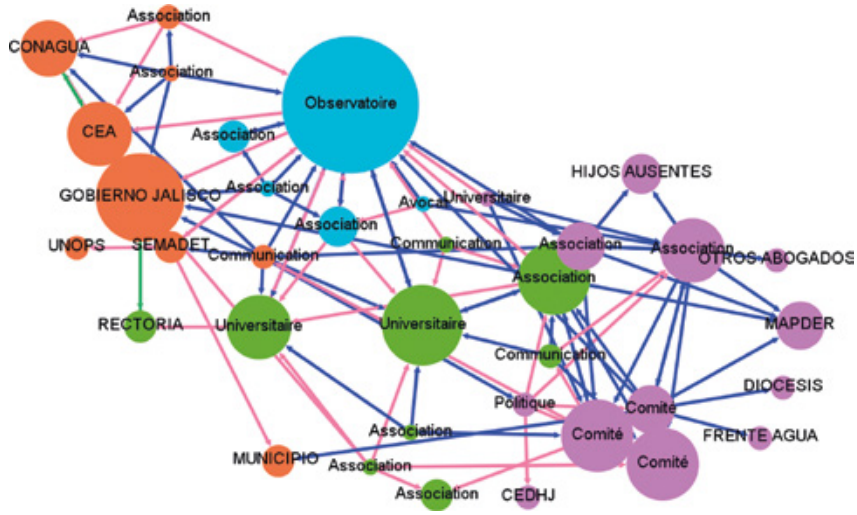


Figure 11.2. Central protagonists' graph, p. 338
Red: Stakeholders mentioned more than twice; Gray: Nuclear protagonists;
No color: Peripheral Actors

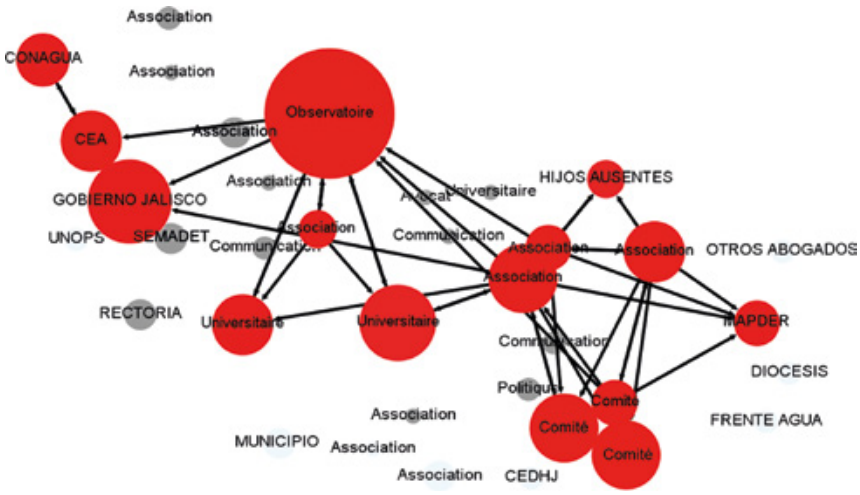


Figure 11.3. Actor's political positioning by classes, p. 341
Red: Ip; Purple: IIp; Blue: IIIp; Light green: IVp; Light gray: not investigated; Dark grey: no data given

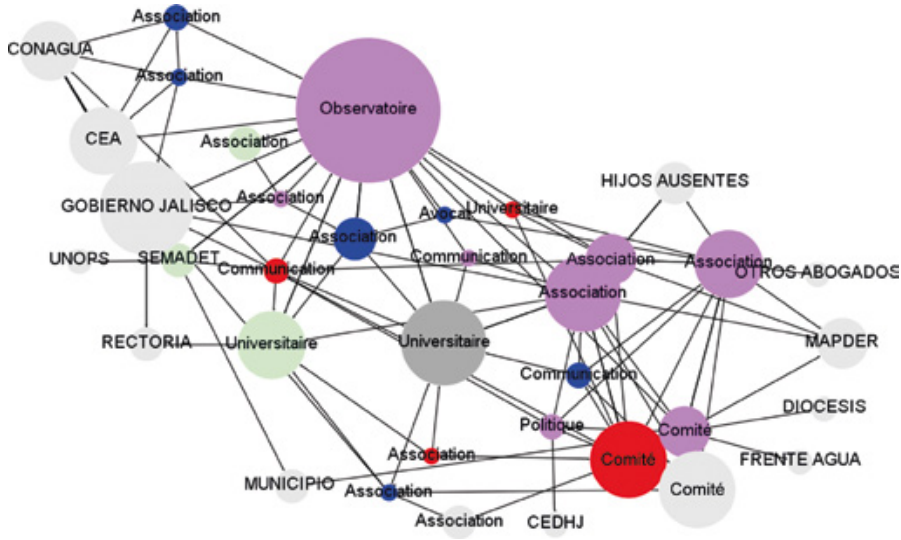


Figure 11.4. Synthetic stance on the dam, p. 342
Red: Id; Light green: IId; Pink: IIId;Blue: IVd; Gray: non-surveyed stakeholders
Conagua and CEA are displayed in blue for being the planning engineers to defend the full dam. The Governor of Jalisco did not state his official position.

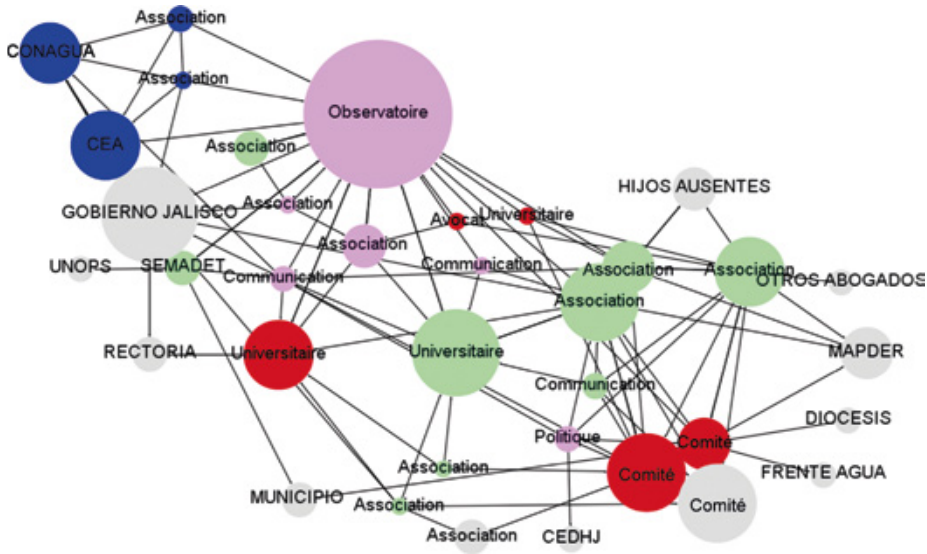
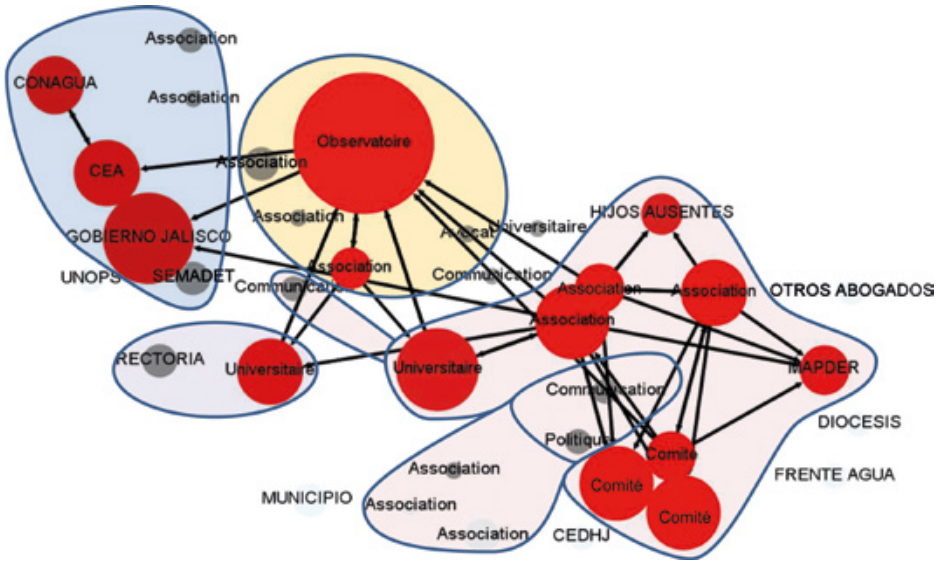


Figure 11.5. Synthetic Graph coalition, p. 345

Pink: Historic Coalition and allies; Yellow: Territorial Coalition; Blue: Government Coalition; Purple: Secular University case; Others: Non-coalitions stakeholders



Chapter 12. The ecologization of water management

Figure 12.1. Comparative analysis plan of the structure of coalitions according to variables B, N and P, p. 367

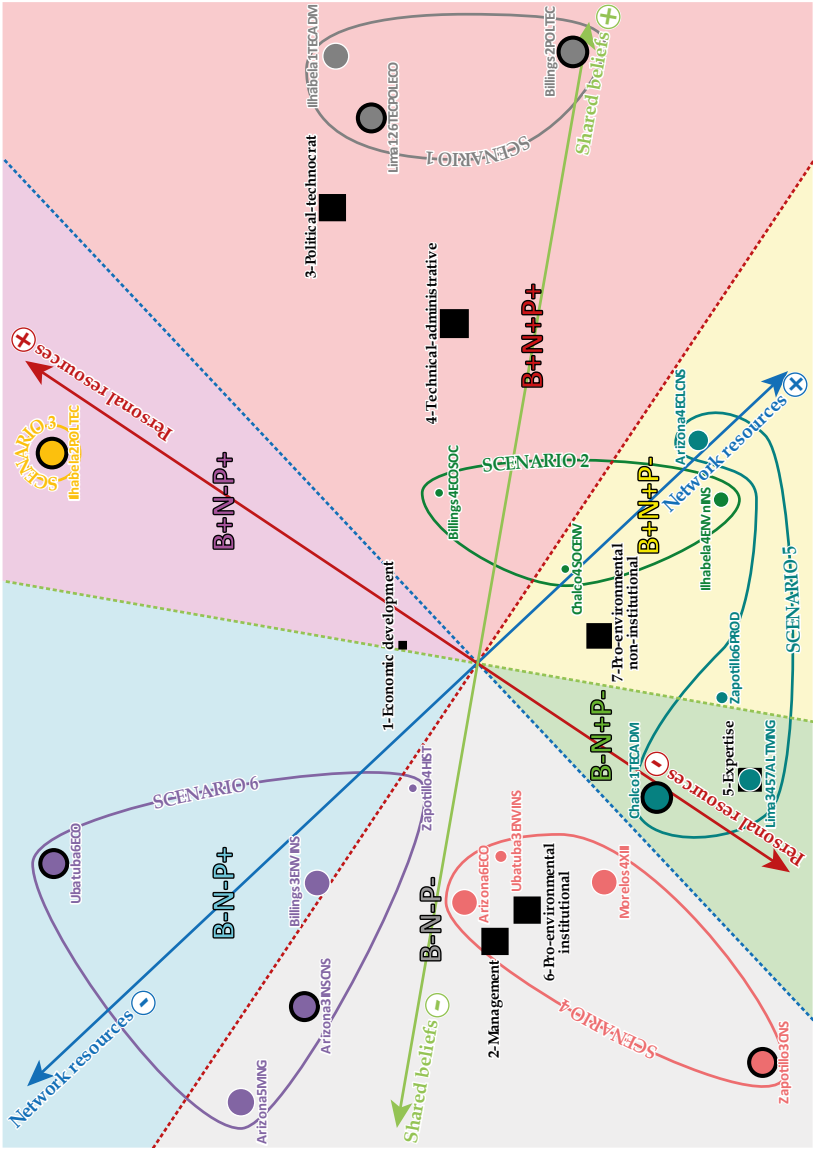


Figure 12.3. Characterization of Scenario 1, p. 370

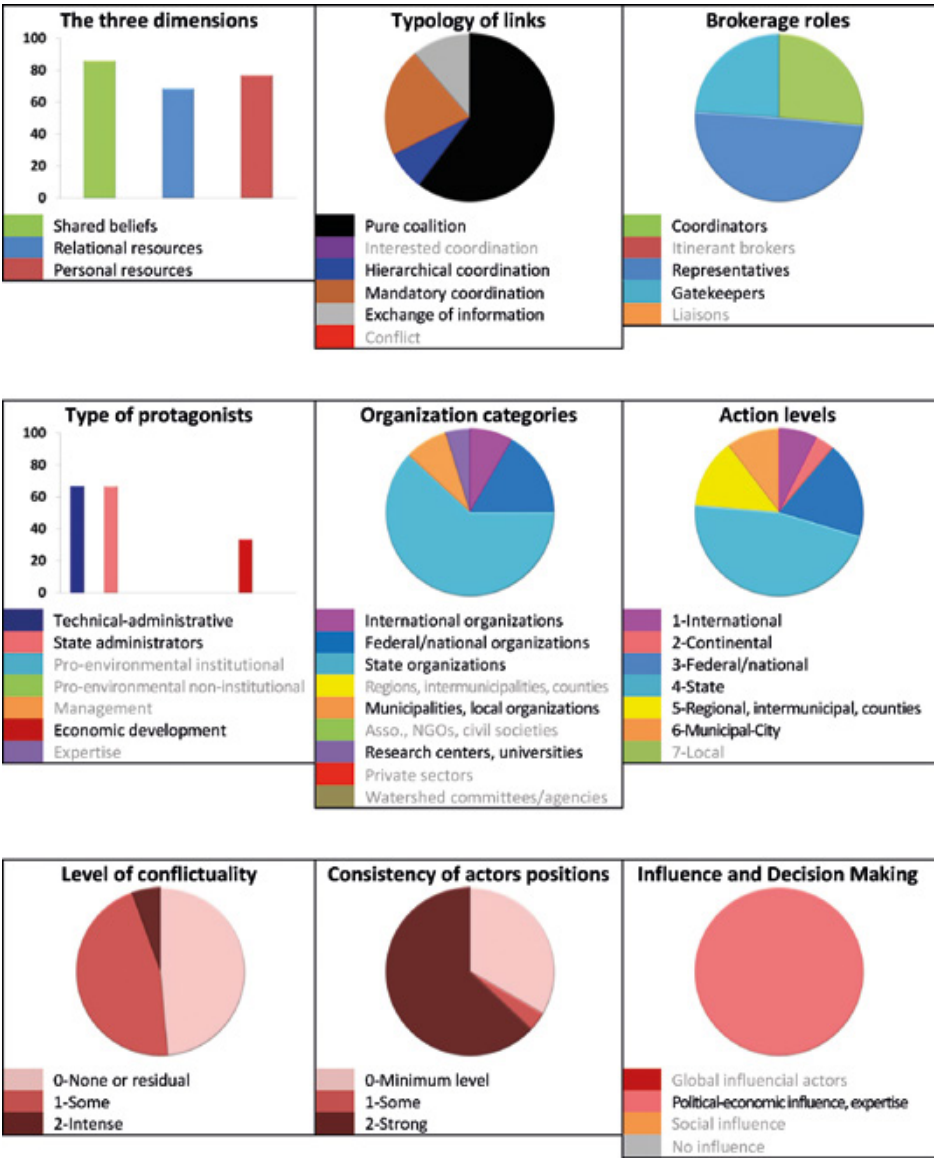


Figure 12.4. Characterization of Scenario 2, p. 371

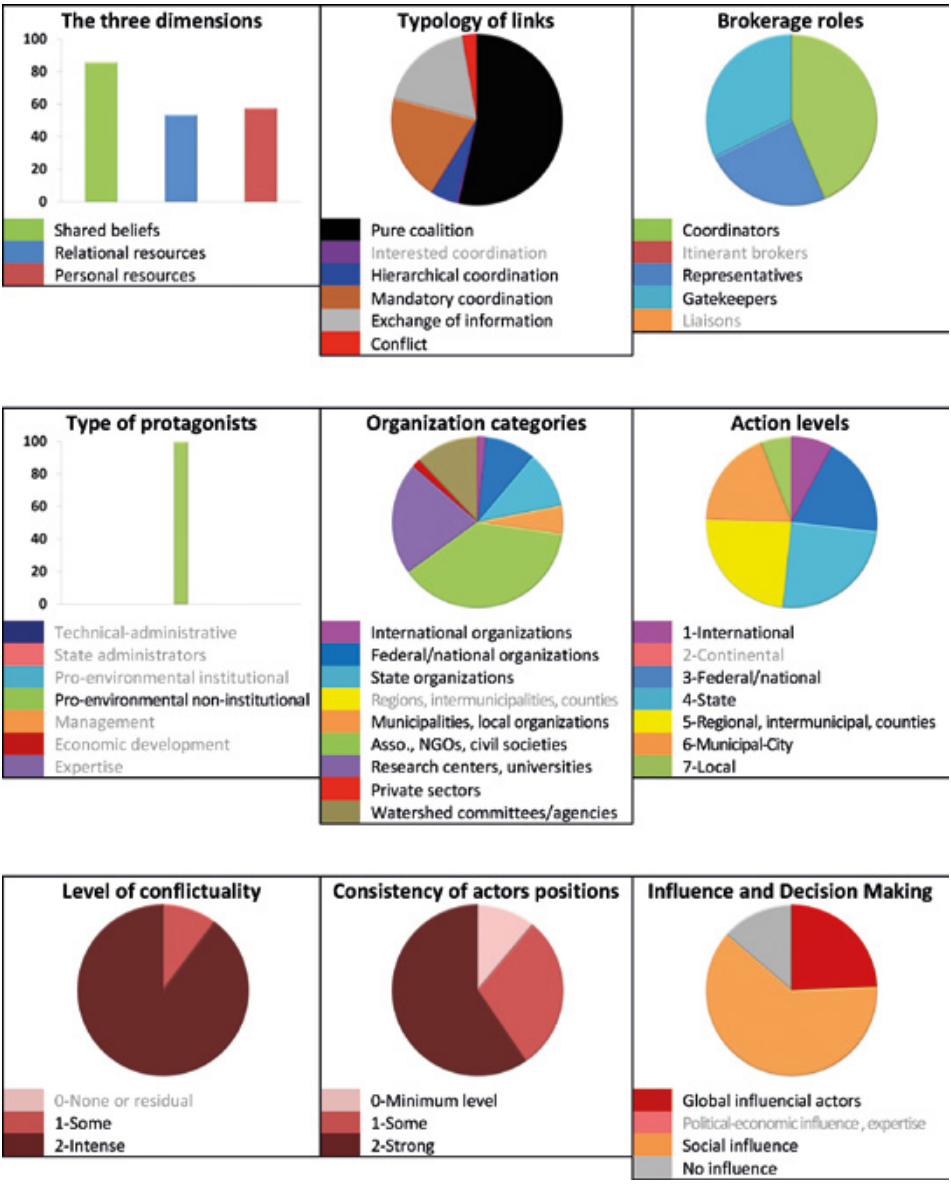


Figure 12.5. Characterization of Scenario 3, p. 372

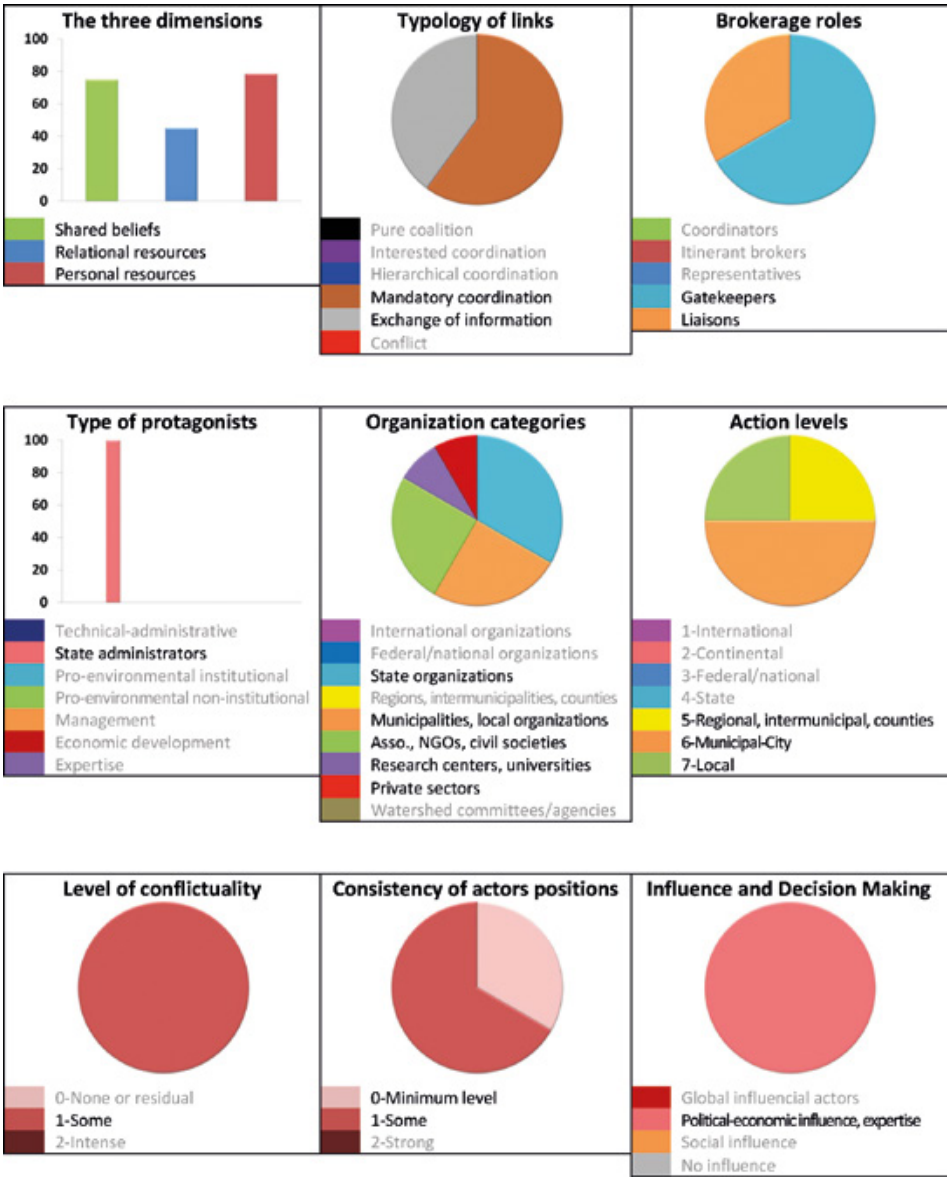


Figure 12.6. Characterization of Scenario 4 , p. 373

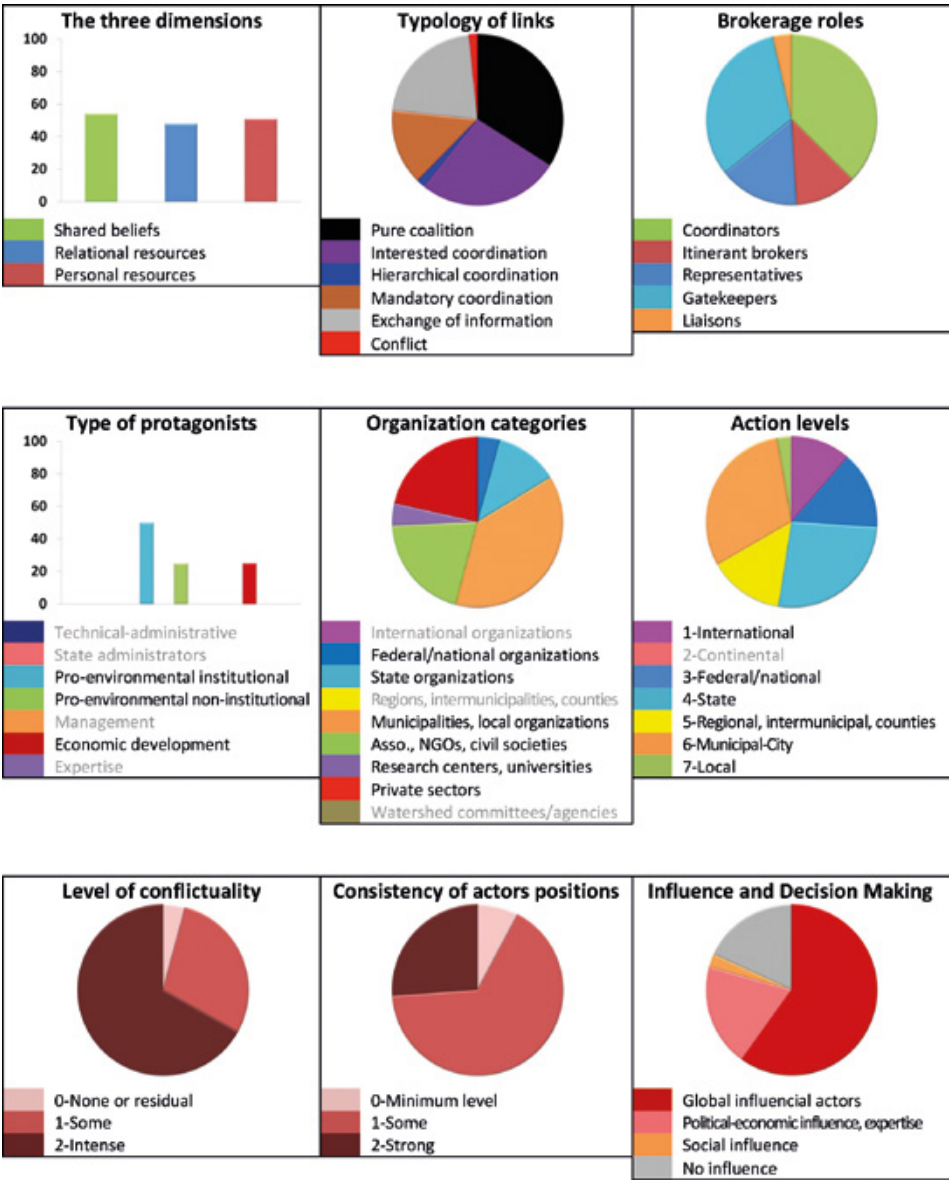


Figure 12.7. Characterization of Scenario 5, p. 374

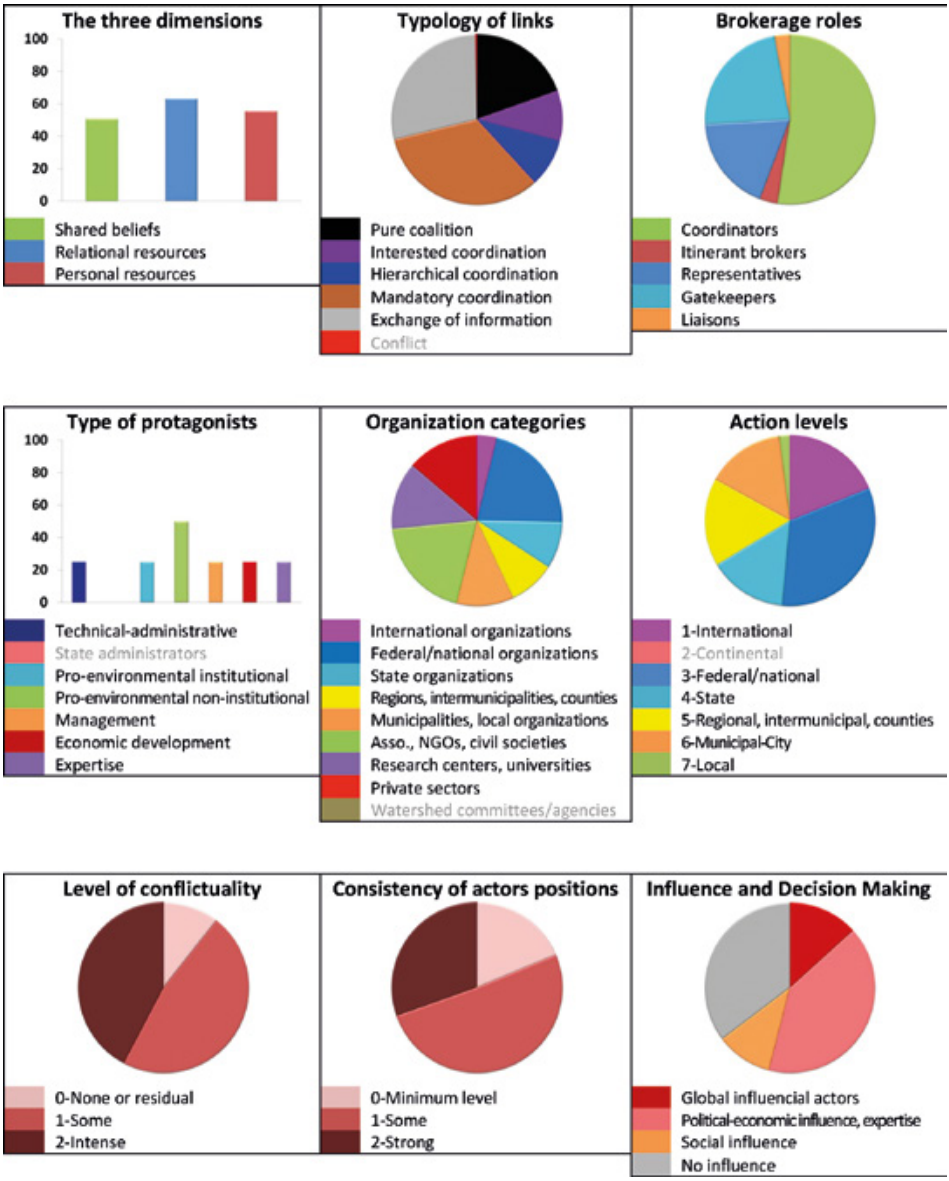
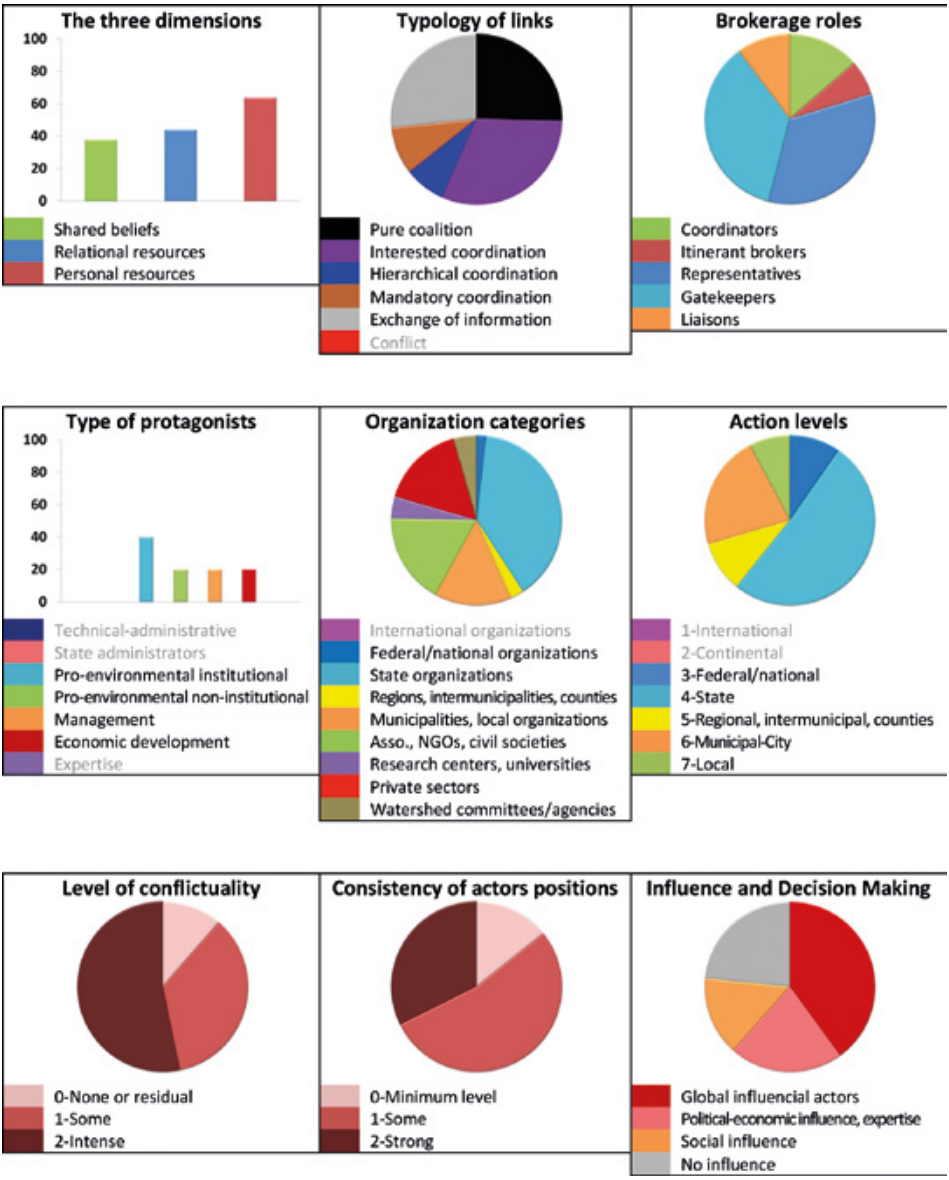


Figure 12.8. Characterization of Scenario 6 , p. 375



This book develops an international comparative approach to water conflicts in several American cities (USA, Mexico, Brazil, Peru, Bolivia). Struggles for water can be related to different issues: increase in water prices, installation of water catchment systems, negotiations of commissioning contracts, promotion of municipal plans for water delivery, etc. Such conflicts tend to structure coalitions which, in turn, influence policy-making; they impact local orders that are embedded at multiple levels of social practices; they involve most of the environmental and political institutions of a city or a country. In order to understand how these hydrocracies work, this book proposes a new framework of analysis taking into account the beliefs of the protagonists of the conflicts, their positions in the policy networks and their social characteristics.

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