**Governance and water security: The role of the water institutional framework in the 2013-15 water crisis in São Paulo, Brazil**


## Abstract

Between 2013 and 2015, São Paulo experienced a major drought. With drinking water reservoirs reduced to 5% of their capacity, the water supply company, SABESP, implemented measures to reduce household water consumption, while the Government of São Paulo State overruled watershed committees to prioritize the supply of water to SABESP. While attention centered on freak meteorological conditions, the management of water resources and water services also played a role; in particular the conversion of SABESP from a state company to a mixed capital company in which the State Government held a majority stake. As the crisis abated, the State Government announced measures to increase 'water security', comprising water diversion infrastructure to increase supply alongside governance reforms to improve state-led responses. This paper examines the relationship between water security and water governance in the context of the São Paulo water crisis. Most literature that analyses the governance dimensions of water security focuses on the principles of "good governance", including decentralization, transparency, and participation, which not only neglects that these can function instrumentally, but also risks ignoring the structure and scaling of the water institutional landscape within which governance takes place. We thus demonstrate how processes and structures that are broadly characteristic of "good governance" both exacerbated the effects of the drought and constrained responses to it. We make two related arguments. First, the mutually-beneficial commercial relationship between the state government and SABESP was fundamental in shaping these dynamics. Second, the drought experience, shaped by these dynamics, has legitimized a shift back towards a centralized, top-down and supply-led approach to water. This is discursively framed as envisaging future 'water security', yet serves to enhance SABESP's revenue streams, and consequently State Government finances. We thus suggest that the conventional view that good governance is conducive to water security needs to be reevaluated.

Key words: water security, governance, water resources, water services, private-public partnership, power relations, São Paulo, Brazil.

## 1. Introduction

In early 2015, the world watched as a water crisis unfolded in São Paulo, South America's largest city. Usually associated with arid north-eastern Brazil, following three dry (southern hemisphere) summers of 2012-13, 2013-14 and 2014-15, south-eastern Brazil experienced its "worst drought on record"[1] (Braga and Kelman, 2016; Coelho et al., 2016). Television broadcasts and newspaper articles showed the water level of the major Cantareira reservoir so low that abandoned cars were uncovered, as it drew down its usually untouched reserve - its "dead volume" (Jacobi et al., 2015; Martirani and Peres, 2016). Meanwhile, the Governor of São Paulo State, together with the CEO of the São Paulo State Water and Sanitation Company (SABESP), assured citizens that the city would not run out of water.

São Paulo Metropolitan Region (SPMR) is the largest conurbation in South America (approximately 1500 $km^2$), located in São Paulo State. The metropolitan region has approximately a population of 21 million residents across 39 municipalities, including São Paulo Municipality, which contains the city centre and financial district. The city extends across the Upper Tietê watershed. Its water serves domestic (55%) and industrial (6%) uses (CBHAT, 2016), but is insufficient to fulfill the city's water requirements.[2] Thus, most of the city's water is drawn from the Piracicaba-Capivari-Jundiaí (PCJ) watershed beyond the city, which supplies the Cantareira system, serving 9 million people (Figure 1).

*Figure 1: São Paulo Metropolitan Region water system (Momm-Schult et al. 2015).*

Despite the State Governor's assurances that the situation was under control – perhaps unsurprising in the midst of his re-election campaign – the city's residents and businesses became accustomed to water shortages from 2014 onwards. The State Government and SABESP, the state-wide utility providing water and sewerage in most municipalities, implemented measures aimed at alleviating the effects. At the household level, these included a discount on water bills for below-average water consumption (10% discount for 10-15% saving, 20% for 15-20% saving, 30% for

[1] https://www.waterscarcitysolutions.org/wp-content/uploads/2016/02/Emergency-measures-in-response-to-drought-crisis.pdf.

[2] Water and sanitation coverage are 98.4% and 81.2%, respectively.

>20% saving, from February 2014),[3] and well as a surcharge for above-average consumption (40% surcharge for ≤20% excess, 100% for >20% excess, from January 2015) (Braga and Kelman, 2016).[4] City-wide measures comprised lowering water pressure across the system plus further reductions in pressure on a daily basis, alongside de-facto rationing of water by periodically turning off trunk stopcocks (Cohen, 2016).[5] These measures were contentious as they were allegedly targeted at poorer areas, mostly on the city's periphery, and disproportionately affected lower-income households that were less likely to own storage tanks (Cohen, 2016), even if such communities were partially blamed for the crisis due to the prevalence of illegal water connections (Braga and Kelman, 2016).[6] Beyond these measures, water users responded with their own solutions, including drilling wells (groundwater permits were not required during the drought) and purchasing water from tankers. Smaller-scale users also invested in storage tanks and rainwater cisterns where possible.

During the crisis, attention was strongly focused on the freak meteorological conditions, and this discourse is reiterated in some accounts (Braga and Kelman, 2016; Otto et al., 2015). Yet, the historic management of water resources and water services in the city exacerbated the effects of the drought (Cohen, 2016): aside from lack of preparedness (Kuss, 2017), changes to the watershed conservation law that reduced the protection of water sources, the low levels of sewage treatment that contaminated major reservoirs (Budds et al., 2005), the failure to control pollution from industrial areas that rendered potential sources unviable,[7] and the conversion of SABESP from a state company to a mixed capital company operating in accordance with commercial principles, which disincentivized investment in infrastructure repair and expansion.[8]

[3] São Paulo state sanitation and energy regulatory agency – ARSESP. Deliberation 514, 22 October 2014. http://www.arsesp.sp.gov.br/LegislacaoArquivos/ldl5142014.pdf

[4] São Paulo state sanitation and energy regulatory agency – ARSESP. Deliberation 545, 7 January 2015. http://www.arsesp.sp.gov.br/LegislacaoArquivos/ldl5452015.pdf

[5] Personal communication, trade union representative, São Paulo, 18 February 2016.

[6] Jordana Timerman, 'No one's quite sure how São Paulo will survive its drought', Citylab, 5 February 2015. https://www.citylab.com/environment/2015/02/no-one-is-quite-sure-how-sao-paulo-will-survive-its-drought/385211/

[7] Personal communication, former state government official, São Paulo, 19 November 2015.

[8] A mixed company mode of privatisation, under which the State Government had a majority (50.3%) stake, was adopted instead of awarding a concession contract.

In late 2015, the rain returned. Federal and State government agencies started to plan longer-term responses to improve "water security" in both São Paulo and Brazil more widely, which comprised infrastructure improvements alongside governance reforms (ANA, 2017). This plan reflects conventional "water security" interventions: maintaining sufficient water over the longer term to reduce deficiencies and risks (Grey and Sadoff, 2007). This emphasis on guaranteeing *water* directs responses towards infrastructure, which not only represents a (return to) a supply-led approach (Bakker, 2003), but also raises questions as to the extent to which such solutions are likely to simply address the *symptoms* of the crisis, as opposed to their causes, which may require challenging existing structures, practices, and interests. Governance, referring to the structures, processes, modes, and dynamics of decision-making around water, can play an important role in both producing water insecurity (Loftus, 2015) and fostering water security (Pahl-Wostl et al., 2013).

It is this interplay between water security and water governance that we address in this paper. On the one hand, most literature that analyses the governance dimensions of water security focuses on the principles of "good governance," including decentralization, transparency, and participation, but which can function instrumentally where they are centered around the provision of water, as opposed to the nature of water-society relations. On the other hand, focusing on these principles and practices risks neglecting the nature, structure, and scaling of the wider institutional landscape within which water governance takes place.

The aim of the paper is thus to examine the relationship between water security and water governance in the context of the 2013-15 water crisis in the São Paulo Metropolitan Region. We will thus explore the role of governance processes and structures in shaping both the effects of the drought as well as responses to it. We consider the historical development of the water institutional landscape, including the incorporation of supposedly progressive principles such as participation and decentralization, and the role of the public-private partnership between SABESP and the State Government. Our analysis suggests that the effects of, and responses to, the drought were constrained by the institutional framework; but that the drought experience, largely framed as natural, has legitimized a water security strategy that returns to a centralized, top-down and supply-led approach to water, which serves the mutually-beneficial financial relationship between SABESP and the State Government.

The study is based on an extensive desk review of published literature in both English and Portuguese conducted between 2014 and 2018, as well as a review of policy documentation and legislation, and examination of secondary datasets. Data were also collected from a set of semi-structured key informant interviews conducted with representatives from government, civil society and the private sector in São Paulo between 2014 and 2017, and complemented by information and observations collected during attendance at selected public water-related events in São Paulo in 2015 and 2016.

Following this introduction, Section 2 reviews debates around water governance within the water security literature, and outlines a conceptual framework for the analysis based on critical water research. Section 3 outlines the historical evolution of the water institutional arrangements and governance processes in São Paulo, in order to contextualize the nature, structure and scaling of the current framework. Section 4 then explores the role and influence of the water resources and water services governance frameworks in shaping decision-making during the crisis and solutions to the drought. In section 5 we discuss the findings, in order to evaluate the relationship between water governance and water security, before drawing conclusions in section 6.

## 2. Governance for water security

The concept of water security has become increasingly influential in both water policy and scholarship, in response to the water-related deficiencies and risks that constitute the "global water crisis" (Bakker, 2012; Bogardi et al., 2012). Yet, as Cook and Bakker (2012) note, the term is both multiple and malleable: on the one hand, it relates to a wide range of water issues, from water availability to water-related hazards; while, on the other, it lacks specificity, being applied to multiple scales (from household to nation-state), with little direction as to how it should be achieved.

Jepson et al. (2017:47) argue that the conceptualization of water security as long-term water sufficiency "identifies water as a predominantly material object ('$H_2O$') that needs to be 'secured,' a view that points towards interventions to capture water to alleviate or address situations where it is deficient or scarce," because it disregards the social relations that configure access to water as well as those that advance human flourishing as part of society-water relations (Loftus, 2015; Swyngedouw,

2013). These authors, therefore, argue that water security should not be seen as a goal, but rather as "a *relationship* that describes how individuals, households, and communities navigate and transform hydro-social relations to access the water that they need and in ways *that support the sustained development of human capabilities and wellbeing in their full breadth and scope*" (Jepson et al., 2017:50). Transforming hydro-social relations to pursue water security implies enabling people and organizations to meaningfully engage in water governance not just as water users but also as political actors.

Indeed, governance is an increasingly important theme within the water security literature. Water governance is defined by Bakker and Morinville (2013:1) as "the range of political, organizational and administrative processes through which community interests are articulated, their input is incorporated, decisions are made and implemented, and decision-makers are held accountable in the development and management of water resources and delivery of water services". Cook and Bakker (2012) argue that the emergence of water security is positive because it emphasizes the need for water governance, to counter more technocratic approaches to water management (e.g. Integrated Water Resources Management), and so "good water governance is necessary to move towards water security at an operational level" (ibid.:100).

Most water security literature that addresses governance refers to 'good governance': ''participatory, consensus oriented, accountable, transparent, responsive, effective and efficient, equitable and inclusive, and follows the rule of law'' (UNESCAP, 2011, cited in Cook and Bakker, 2012). Grey and Sadoff (2007) present governance as necessary to support water security for economic growth: strong economic growth fosters effective water management, which leads to good governance, which results in more investment in water infrastructure and institutions, and which facilitates economic growth, and so on. Bogardi et al. (2012) advocate better *principles* of governance, including access to information and stakeholder participation, as well as new *modalities* of governance, especially polycentric governance (involving multiple stakeholders) and adaptive governance (flexible vis-à-vis uncertainty and complexity). They regard these as key mechanisms to achieve "consensus solutions […] achieved by evidence-based mediation" (ibid.:35). Similarly, Pahl-Wostl et al. (2013) promote shared decision-making, social learning, (independently) facilitated negotiation, participation, transparency, information sharing, and decentralization to overcome lack of political will, ineffective

jurisdictions, weak formal institutions, asymmetric power structures, and lobbying by special interest groups.

Yet, in these accounts, good governance tends to be treated vaguely, descriptively, normatively, and homogenously. Governance modalities and principles are presented with little practical detail or consideration of impediments: legal frameworks need effective enforcement, access to information is meaningless if stakeholders cannot read or interpret it, and participation can depend on resources, education, gender, and social status (Budds, 2009; Empinotti, 2010). They are presented as generalized ideals with little reference to context specificity (Bakker and Morinville, 2013; Himley, 2008). Overall, therefore, there is little acknowledgement in these analyses of how power relations and politics can both contribute to water insecurity (Loftus, 2015), as well as shape key elements of governance to support water security. For example, Bakker and Morinville (2013) accept that social learning holds potential to include non-traditional actors who may produce new ideas and/or challenge existing practice, yet question whether this is realistic in contexts where such actors (e.g. indigenous leaders) often lack the necessary social status to exert influence, and/or where existing practices are deeply embedded in existing power structures (e.g. caste) or tied to large-scale capital accumulation (e.g. mining).[9] These authors, therefore, refute the "view of governance as a (straightforward) 'recipe'" for water security (ibid.:11).

Power relations do not only influence governance around water security directly, as described above, but also extend to the political work that water security can effect (Bridge, 2015; Cook and Bakker, 2012). While most analyses of governance for water security focus on formal and higher-level institutional arrangements, studies that have examined micro-level and informal decision-making demonstrate how water security interventions can shift state-society relations, which are almost entirely unquestioned in the water security literature. For instance, Vandewalle and Jepson's (2015) study of the implementation of water treatment technologies in low-income and unserved Hispanic households in Texas showed that these did not just offer stop-gap solutions to precarious supply, but rather reinforced individual and private responsibility for solutions, thereby reducing pressure on collective or political

[9] They also assert that social power can be conducive to water security, as demonstrated by Ostrom's studies of cooperation and collective action in managing common-pool resources. However, it is not clear how social power in relatively homogenous contexts (of autonomous and/or indigenous villages) can be extended to situations where power differentials and economic interests are more significant.

interventions. In this way, the role of governance can be understood as not just *making rules* for water security, but also *achieving rule* through water security (Bridge and Perreault 2009; Himley 2008; Lemos and Agrawal 2006).

Returning to the framework proposed by Jepson et al. (2017), this advocates a shift in the focus of water security interventions away from the supply of water and towards the nature of water-society relations (see also Linton, 2012). In relation to governance, this implies a need to complement an analysis of decision-making frameworks and processes for water security interventions, with attention to how those interventions interact with existing social structures and orders at different scales (Linton and Budds, 2014). The formation of new organizations, spaces and scales for water governance is often presented as a pragmatic policy endeavor, yet may serve as a means through which to stabilize existing status quos that reflect unequal power relations (Bridge and Perreault, 2009; Norman et al., 2014). For example, contrary to dominant discourse, Norman and Bakker (2009) observed that decentralization did not necessarily either reduce the role of the national state or increase decision-making power at the local level. Similarly, Warner (2007) identified a lack of both decision-making authority as well as power-sharing within multi-stakeholder platforms at the watershed level. While rescaling governance to the watershed level reflects a popular policy response, Cohen and Davidson (2011) identified the potential for creating overlapping and conflictive governance tools and processes, while Budds and Hinojosa (2012) argued that this change could potentially enhance the power of dominant groups of water users at the expense of others.

We now turn to the case study of São Paulo, in which we will examine how the water governance framework has evolved, in order to understand how it shaped responses to the drought, and decision-making during the crisis, and with what effects.

## 3. The evolution of water governance in the São Paulo Metropolitan Region

Unlike other countries, the Brazilian federal system operates according to a hierarchical system of legislation that defines access to natural resources. In the case of water, two laws - the Water Law and the Sanitation Law – set out the management systems, policies, and fees, for water resources and water and

sanitation services, respectively. This combination of these two laws and their institutional arrangements shapes water governance practices; hence, to understand how water access and distribution is organized in São Paulo and its metropolitan region, it is important to understand existing legal and institutional structures as well as how they have been shaped for this specific context over time.

In Brazil, water access has been historically organized by the government, which has responded to demand for different uses in a centralized manner. While bulk water allocation is controlled by the federal government, the institutional arrangements for water supply (and sanitation) fall within the remit of the state and municipal governments. Over the last century, water services in the SPMR have been influenced primarily by legal and management changes. These have led to water and sanitation changing from private to public management, and then from public to private-public, and to governance being rescaled from the municipal, to the regional, and then to the state level (Figure 2). These influences, and the changes they brought, have forged the water institutional landscape that exists today, and which is important in understanding how water governance has evolved in this particular way.

*Figure 2: Water access and distribution in the SPMR: Institutional arrangements over time*

In the nineteenth century, urban water supply water was provided by private companies in Brazil (Aversa and Oliveira, 2017). However, by the 1930s, the need to expand infrastructure to support the country's industrialization fostered the creation of a state-level autarchy responsible for managing and supplying water to the SPMR, the future industrial center of the country. Under this institutional design, state-level agencies were responsible for providing bulk water to local municipal agencies that, in turn, would be responsible for distributing water to households (Aversa and Oliveira, 2017). However, due to São Paulo's growing political and economic importance, it was the state-level autarchy that became responsible for supplying water to São Paulo municipality, thereby shifting control over water from the local to the state level for the first time.

In the 1970s, the state government consolidated its control over water supply in the SPMR in response to the new Water Supply Plan (PLANASA). Designed by the federal government during the dictatorship, PLANASA institutionalized the hydraulic mission for water supply in order to serve growing demand for water in the now large urban and heavily industrialized SPMR. This approach gave rise to the construction

of the Cantareira reservoir system in the 1970s. Comprising a complex network of canals and pumping stations that diverts 31 cubic meters of water per second from tributaries of the Piracicaba River, the system is responsible for providing water to the population of São Paulo, about 100 miles to the southeast (Abers and Keck, 2013). The installation of such a complex system was key in influencing the decision-making processes with regard to the SPMR.

At the same time, PLANASA centralized the water supply management system and its financing at the federal level, and created state-level agencies to coordinate and provide water services. This institutional reform thus constituted a top-down reform that replaced the previous municipal autonomy over water supply. As a result, many of the 39 municipalities in the SPMR transferred their water supply to the newly-created state-level company, SABESP. This structural shift had profound implications for water governance. It meant that SABESP not only had privileged access to federal public investment and incentives through PLANASA, but it also controlled the Cantareira water system that supplied the municipal agencies with bulk water, and alongside it, that is, both the infrastructure and the water permit. In addition, it assumed water distribution for most municipalities in the state, including São Paulo, which simultaneously overpowered and weakened the existing municipal and metropolitan water supply agencies (Aversa and Oliveira, 2017).

In the 1990s, tensions between state and municipal level water agencies reached a climax due to the implementation of neoliberal reforms. These tensions stemmed from two related factors: the push to privatize water and sanitation services under the discourse of promoting greater efficiency and accountability; and the proposed continued centralization of water supply services at the state level (Aversa and Oliveira, 2017; Heller and Rezende, 2008; Murtha et al., 2015). It was as part of these reforms, which included the 1995 Concession Law (8987), that SABESP was converted from a public company into a publicly traded mixed capital company in 1997 by floating shares on the São Paulo stock market (BM&FBOVESP) (Aversa and Oliveira, 2017; Heller et al., 2014). The state government held a majority stake (50.3%). However, despite this change, bulk water allocation was still controlled by federal and state level government agencies, although the decision-making structures around them were about to change.

Two new laws were subsequently approved by Congress: the 1997 Water Law (9433) and the 2007 Sanitation Law (11485), which changed the nature of water

access and allocation. These two pieces of legislation institutionalized formal governance practices into Brazil's water management system.

The 1997 Water Law introduced watershed committees and councils, which comprised representatives of civil society organizations, water users, and municipal, state, and federal government agencies, who were responsible for drawing up water and sanitation plans that would guide state development (Abers and Keck, 2013). Such changes affected bulk water allocation, a key link between the water resources and water services institutional frameworks (Figure 3). Henceforth, bulk water allocation permits would be issued not by the federal government, but rather in accordance with the recommendations of the watershed plan, which defined how much water should be distributed to each sector. For example, the Alto Tietê watershed plan established water supply as its priority use, since its area is heavily populated and demand would not be fully met, and thus the bulk water allocation permits were mainly designated to water supply. Therefore, government agencies no longer decided the allocation of water rights, and instead had to follow the watershed plans.

*Figure 3: Interdependence between the Water Resources and Water Services governance systems (own elaboration)*

The two new laws also changed the role and influence of stakeholders in water decision-making processes, thus expanding governance beyond the state and forcing technocrats to dialogue with representatives from other social sectors. In the SPMR, this process thus encompassed a new set of stakeholders who had the ability to shape water resources and water supply systems and their governance practices, including the state government's Water and Electrical Energy Department (DAEE), municipalities (represented by their mayors), water supply companies, the Industrial Federation, the Agriculture Federation, and a range of civil society organizations.

The 2007 Sanitation Law regulated the types of companies allowed to supply water to municipalities, which effectively enabled SABESP to become the main water service supplier across São Paulo state. As a mixed capital company, SABESP continued to enjoy the advantages of public support, including access to federal public resources and funds, without having to fulfill the obligations that could have compromised interests, such as transparency. This meant that the company was protected from risk by being able to keep liabilities off its books, while simultaneously being able to conceal relationships between shareholding companies (Heller et al.,

2014). Thus, in effect, the Sanitation Law enabled a new institutional modality that operated under market conditions as a private entity (i.e. maximizing the shareholders' return), while reaping the benefits of a public agency (e.g. benefiting from access to public resources and the monopolization of water supply services at the local level). It is to the implications of this new public-private institutional modality for the drought and its responses that we now turn.

## 4. The role and influence of governance on the 2013-15 drought in São Paulo

During the 2013-15 drought, the main reservoir system supplying water to the SPMR, the Cantareira system, was the most affected, dropping to 5% of its capacity by September 2014 (Artigo 19, 2014). In theory, the governance systems for the management of water resources and water and sanitation services established the processes and responsibilities for deciding how to manage access to water under this situation. However, the governor of São Paulo state together with representatives from key state-level agencies – including SABESP - took control of the major decisions and coordinated their actions in order to supply water to São Paulo municipality as the first priority, and to the rest of the metropolitan region (38 municipalities) as the second, thereby superseding the formal decision-making processes in place. Yet, how did this come about?

In the case of drought, the first action that would usually be taken would be to adjust water allocation permits in order to prioritize water supply over other uses. According to the Water Law, in critical periods water should be used to meet people's basic needs (Hídricos, 2002). Since the water supply system for the SPMR depends on a water transfer from a different watershed that lies beyond its boundaries - the Piracicaba, Capivari and Jundiaí (PCJ) Watershed (Figure 1), - the water allocation negotiation should involve not just the Upper Tietê Watershed committee but also that of the PCJ. In addition, the National Water Agency (ANA) should be involved, since water transfers and bulk water allocation fall under its responsibility. In parallel, the Sanitation Law establishes that SABESP should produce a contingency plan that defines how water distribution would be controlled under drought conditions.

However, these mechanisms only come into force once a drought is officially declared, and this did not happen in São Paulo until August 2015, even though the

drought had started in 2013 and its effects were clearly being felt across the city from 2014, as noted earlier (Artigo 19, 2016). Until this point, both the state government and the federal government had avoided acknowledging that there was a water crisis, and designating it as a drought, for political reasons, because national (president) and state (governor) elections were both taking place in October 2014. This explains why some measures to address the drought, such as the discount for reduced consumption, and the surcharge for increased consumption, levied on household bills were only put in place in October 2014 and January 2015, respectively.

Despite the failure to declare a drought, negotiations over water withdrawals took place within the Technical Assessment Group for the Management of the Cantareira Water System (GTAG), created in February 2014 by the National Water Agency (ANA) and the São Paulo State Government Department for Water and Energy (DAEE) under their legal attributions (ANA, 2014). The CTAG comprises representatives from ANA, the São Paulo state government's Department of Water and Electrical Energy (DAEE), SABESP, the PCJ and Upper Tietê Watershed committees, and has the goals of defining measures to be taken in order to guarantee water supply, as well as to monitor the quality and quantity of water in reservoirs and publish these data (ANA, 2014).

The decisions taken by GTAG in response to the water crisis focused mainly on reducing water withdrawals from the Cantareira System. By March 2014, ANA and DAEE started to reduce the amount of water withdrawn, and continued to do so over the following months. The reductions were greater for the withdrawals to supply users in the PCJ watershed (25%) than they were for those in the Upper Tietê watershed (10%). Neither the PCJ nor the Upper Tietê watershed committees raised objections to these reductions, but this may be because their participation was limited to technical boards, which mainly concentrated on monitoring precipitation and reservoir volumes, and proposing guidelines for saving water at the watershed level (CBHAT, 2016; Artigo 19, 2016).

Given this role of the watershed committees, decisions became concentrated among federal and state-level agencies, including SABESP. However, no clear plan emerged for water saving beyond the reductions in water withdrawals from the Cantareira system. SABESP's main response comprised the reduction of water pressure across the system in order to reduce leakage (Cohen, 2016). This contributed to the emergence of two activist networks (Aliança pela Água and

Coletivo de Luta pela Água), who emerged as the main critical voices during the drought. They worked with federal and state public prosecutors to demand information to understand the crisis, to challenge government reports and solutions, and to call for actions to guarantee access to water (Martirani and Peres, 2016).

The situation was further compounded when, in September 2014, ANA announced that it would no longer participate in the GTAG because the São Paulo State Secretary of Sanitation and Water Resources was not fulfilling its commitments to reduce dependency on the Cantareira system and to comply with the reduction in water withdrawals (Artigo 19, 2014). The GTAG was subsequently dissolved. This meant that, thereafter, decisions and actions to respond to the water crisis were concentrated at the state level, through the governor of São Paulo state, state-level agencies, and SABESP.

Once the state agencies were in control, and the elections were over, São Paulo state finally declared a drought in 2015. The declaration enabled the implementation of drought measures, as above, but also allowed state agencies to procure public/private finance to implement solutions. The solutions proposed by these state agencies reflected the traditional hydraulic paradigm - increasing water supply rather than reducing water demand - reframed as the pursuit of 'water security'. This comprised infrastructure expansion, including to interconnect the city's main reservoir systems (including Cantareira) and to divert water from other watersheds (Artigo 19, 2014; Cohen, 2016; CBHAT, 2016; Rocha, 2017). In this way, the drought was framed as a problem of low precipitation and infrastructure capacity, as opposed to high levels of water demand, leakage, and pollution.

Even though, in principle, the watershed committees are responsible for approving water infrastructure through the revision of watershed plans, these decisions were taken by state agencies in a top-down manner.[10] Therefore, the negotiations and decisions to address the water crisis did not take place within the formal participatory governance system, but outside it, thus undermining the Water Law and its institutions. In response to this autocratic recentralization of decision-making by state agencies, and its wider aim of pursuing a traditional hydraulic paradigm, the other stakeholders also stopped using the formal negotiation channels. This meant that the judicial system became the only channel for interaction, as federal and state

[10] Personal communication, state government official, São Paulo, 24 February 2016.

public prosecutors questioned the state-level agencies' actions, to which these were obliged to respond.

The strategy of the state governor and the state-level agencies, including SABESP, to pursue supply-led solutions, had the effect of protecting SABESP's assets and thus its revenue stream. On the one hand, SABESP's interest in protecting its business led it to strongly defend its water withdrawals from the Cantareira system so as to be able to continue to supply its most profitable customer base in the SPMR (especially São Paulo municipality); at the expense of other municipalities in São Paulo state, such as Campinas and Itu, where water rationing was implemented. On the other hand, maintaining this water supply was both crucial for the state governor's election campaign, and also for maintaining the revenue stream to the government of São Paulo state through its majority shareholding. This shared strategy is reflected in the adoption of a water security strategy that did not seek to manage or reduce demand for water, but rather sought water from other watersheds and proposed new hydraulic infrastructure, while ignoring polluted water sources, avoiding investment in sewage treatment, and ignoring measures for water conservation (Kuss, 2017).[11] Importantly, this strategy required measures to preserve the supply-led water paradigm, and to override participatory governance mechanisms that potentially threatened it. It was the drought that enabled this strategy to come into play, mobilized through a particular framing of water security as "water infrastructure security" (ANA, 2017) that required (re)centralized state control.

## 5. Governance: the solution or the problem for water security?

Rather than analyzing the water resources and water services systems separately, as is done in much literature on water in Brazil, we have examined both institutional arrangements as a single governance framework. This allowed us to understand their interconnections as well as their functioning in the context of the 2013-15 drought, and to interpret how the particular responses and outcomes were forged. In particular, it enabled us to make sense of how an attempt to decentralize and to promote participatory institutions was not enough to reshape a centralized, technocratic and supply-led paradigm of water management, despite the introduction of stakeholders and spaces of negotiation as part of the governance system. This,

[11] Personal communication, civil society representative, São Paulo, 18 November 2015.

we argue, is because the hydraulic paradigm served important vested interests that had also been consolidated through the restructuring of the governance system, especially the mutually beneficial commercial relationship between the state government and SABESP.

For some authors, the absence of responses from formal participatory institutions to the water crisis can be explained by two factors: the lack of participation, transparency, and accountability – the principles of good governance - in the water governance system, as well as the lack of environmental justice (Jacobi et al., 2015; Fracalanza and Freire, 2015). Others have suggested the absence of strategic planning and the use of scientific information to support decision-making processes (Cortez et al., 2015), alongside a suite of more general assertions around population pressure and water wastage (Braga and Kelman, 2016; Otto et al., 2015; Tundisi and Tundisi, 2015). However, this and other literature has presented no discussion of the historical and structural factors shaping governance practices, which, in this case, allowed the São Paulo state governor as well as the state agencies and SABESP to control responses to the 2013-15 water crisis.

We recognize that the encounter of old and new institutional arrangements engendered the governance practices in place, and created a structure that ultimately transcended, and discarded, the spaces of negotiation promoted by the Water Law and the Sanitation Law. This suggests that water governance should not be seen as simply a matter of organizing decision-making around water in the interests of multiple stakeholders (cf. Braga and Kelman, 2016), but understood as an arena within which power relations play out; in this case subject to (re)domination in order to reassert control over a system that was crucial for certain political and economic ends (Bridge and Perreault, 2009). Therefore, we would contend that it is not just the processes of governance that merit examination as part of water security analyses, or even simply the ways in which such processes are inflected by power relations, but also the structure and scaling of the institutional framework, which is both an effect of power and can constitute an instrument of power( Cooke and Kothari, 2001; Agarwal, 2001). We are thus inclined to agree with Bakker and Morinville's (2013) assertion that governance should not be seen as a simple 'recipe' for water security, and indeed would go further in questioning the commonly-held assumption that the principles of good governance are in themselves conductive to fostering water security.

As a result of our analysis, we have identified three main entry points that reveal how historically evolved structures and processes of governance shaped both decision-making during the water crisis, and responses to the drought: (1) persisting sectoral approaches to water management that constrain water governance; (2) the (re)scaling of decision-making processes that result in unclear roles for stakeholders; and (3) the continued power asymmetries in governance frameworks, exacerbated by commercial relationships. We now take each of these points in turn.

First, the persisting sectoral organization of water within government in Brazil facilitated centralized state action to guarantee water security through infrastructure. This reflects a view of water management as merely a matter of defining flows from specific water bodies to specific regions. Thus, the remit of the Water Law is to regulate access to surface water, but without any role in the infrastructure, allocation, or land use patterns that influence water availability, quality, and access, and without the authority to regulate specific water uses. Furthermore, budgets for the mechanisms that guarantee water availability and allocation are divided between other sectors, such as energy, sanitation, agriculture, and transportation. Therefore, while the legislation seeks to coordinate water resources and uses, it continues to respond to different sectors and its control remains divided among different government agencies. This maintenance of sectoral water management across government weakens the principles of participation and decentralization that are embedded in the Water Law, because critical decisions with regard to water allocation and investment in infrastructure are controlled by other sectors that maintain centralized and technocratic decision-making processes and can disregard the decisions and recommendations from watershed plans that are established by law (Empinotti et al., 2014).

Second, the decentralization of the water governance framework transferred responsibility from the federal government to state and local governments, and from government ministries to autonomous public institutions, headed by ANA (Lemos and Oliveira, 2004). At the same time, governance of water resources was rescaled to the basin level, which challenged the political boundaries of states and municipalities, and called for subnational and intergovernmental dialogue (Abers and Keck, 2013). This means that, in transboundary basins where the main river is under federal control, at least three different levels of government will be involved: federal, state, and watershed (Lemos and Oliveira, 2004). However, decentralization did not extend decision-making to the local level given that there is a minimal role for

municipalities in the management of water resources (which are mainly managed at the state and federal levels); and that their main concern pertains to domestic water services, which, due to the evolution of the water services governance framework including under the Sanitation Law, are now predominantly provided by external water supply companies.[12] Therefore, this particular scaling of water institutions in São Paulo state led to vacuums in responsibility in some instances, and overlapping functions in others. This scenario led to the São Paulo state government and SABESP taking advantage of these deficits and positioning themselves as the main decision-makers, overriding both water committees and municipalities during the drought to reconcentrate decision-making power at the state level.

Third, a critical factor in understanding the water crisis is how power asymmetries were constructed among stakeholders, and how the São Paulo state government dominated governance processes and spaces. For example, the state government, through its political and financial power, controls mayors and state agencies, such as DAEE, which holds the presidency of the watershed committees. The state governor also appoints the CEO of SABESP. As SABESP is a mixed capital company with a majority stake owned by the state government, the state government is thus also able to control the water supply sector for the state while promoting its management in accordance with market principles. This led to the state promoting commercial strategy for SABESP, protecting the company's assets, guaranteeing its financial returns, and opening up new opportunities for investment (infrastructure), thereby privileging revenue generation over the fulfillment of basic water and sanitation needs for São Paulo's population. During the water crisis, the state government secured SABESP's access to water withdrawals, and endorsed its response to adjust pricing rather than promote water conservation. Moreover, this strategic commercial alliance between the state government and SABESP served to wield control over, and dismantle, participatory spaces of negotiation, that resulted in the judiciary becoming the main forum of interaction. The outcome was thus not only the prevalence of a self-interested agenda, but the weakening of the governance system, in turn leading to a return to a centralized and technocratic mode of governance.

In sum, while structures of decision-making shaped responses to the drought, the drought also reconfigured water governance arrangements. In framing the drought as a deficit of precipitation and infrastructure, the state government was able to

[12] In the SPMR, five municipal water services providers still exist, the majority of the rest having been taken over by SABESP (Aversa and Oliveira, 2017).

mobilize a traditional hydraulic paradigm to promote water security. As we have argued above, this particular framing of water security benefited the state government's political and economic interests, but it also serves to maintain the status quo in terms of securing the future supply of water while avoiding deeper structural reform. This is reflected in the draft Water Law amendment bill (ANA, 2017), which defines water security in terms of the supply of water to be achieved through water infrastructure on the one hand, and governance reforms on the other. This is not a progressive modality of governance that promotes democratic practices among multiple constituencies, but rather a technocratic one that seeks to centralize control and promote capital accumulation. Therefore, the assumption that governance is necessarily conducive to water security needs to be reevaluated.

## 6. Conclusion

In March 2016, the governor of São Paulo announced the end of the drought (Artigo 19, 2016). Measures to avoid future crises included significant investment in water transfers from the Paraíba do Sul watershed to the PCJ watershed in order to feed the Cantareira system and guarantee water security for the SPMR (Braga and Kelman, 2016). At the same time, SABESP reported an increase in profits of 15.4% by the end of 2015, as the result of the increased water tariff, and in 2016, the highest profit in the history of the company.[13] The actions taken during the drought, combined with a cut in investment and a reduction in technical staff were responsible for these financial results.[14]

The principal response by the federal government was the proposal of an amendment bill in which the main change was the political appropriation and mobilization of the term "water security", defined simply as measures to supply water to where it is needed over the long term. The proposal combines an emphasis on infrastructure solutions with the introduction of a new council composed of federal representatives responsible for monitoring water security conditions and for proposing measures and investment to guarantee water availability under conditions of stress.

[13] http://www.redebrasilatual.com.br/economia/2015/08/em-meio-a-crise-de-abastecimento-sabesp-aumenta-lucro-de-acionistas-em-11-5-6204.html

[14] https://www.istoedinheiro.com.br/vale-pena-investir-na-sabesp/

In São Paulo, therefore, processes and structures that are broadly characteristic of "good governance" both exacerbated the effects of the drought and constrained responses to it. The sectoral and fragmented structure of the water governance framework allowed for the perpetuation of state control, despite the existence of decentralized and participatory water institutions. The mutually-beneficial commercial relationship between the State Government and SABESP was fundamental in shaping these dynamics, because it oriented both drought responses and governance strategies in directions that privileged revenue streams over basic needs. Moreover, the drought experience, shaped by these dynamics, has legitimized a shift back towards a centralized, top-down and supply-led approach to water, discursively framed 'water security'. Water security thus became part of the governance structure that served to maintain existing power relations in place. It legitimized infrastructure and governance fixes in order to perpetuate a centralized, and technocratic agenda in which state actors repositioned themselves as the main decision-makers, and which served to enhance the revenue of both SABESP and the state government.

It is therefore not the *presence*, but the *evolution* and *structure*, of governance that is key to understanding these dynamics and their effects. Simply focusing on the presence of governance disregards how power relations are unevenly distributed throughout decision-making structures, the presence of networks of control and influence, and the ways in which policies can reinforce non-egalitarian distribution of functions (Swyngedouw, 2009). The consequences of such structures can lead to autocracy, masked by the production of artificial agendas that are presented as common and collaborative, but which serve hidden underlying motives. In sum, structures of governance can promote inequality and power asymmetries just as they can promote progressive and democratic decision-making.

This conclusion aligns with a post-political perspective, in which governance is understood as an assemblage of governing technologies fused around consensus, agreement, accountancy metrics, and technocratic environmental management, and which thus constitutes a technical fix like any other (Swyngedouw, 2005). If we understand water security not simply about providing physical water but changing the social relations through which water is organized (Jepson et al., 2017), water governance for water security should follow suit. We thus suggest that the conventional view that good governance is conducive to water security needs to be reevaluated.

## 7. References


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Figure 1: São Paulo Metropolitan Region water system (Source: Momm-Schult et al. 2015).

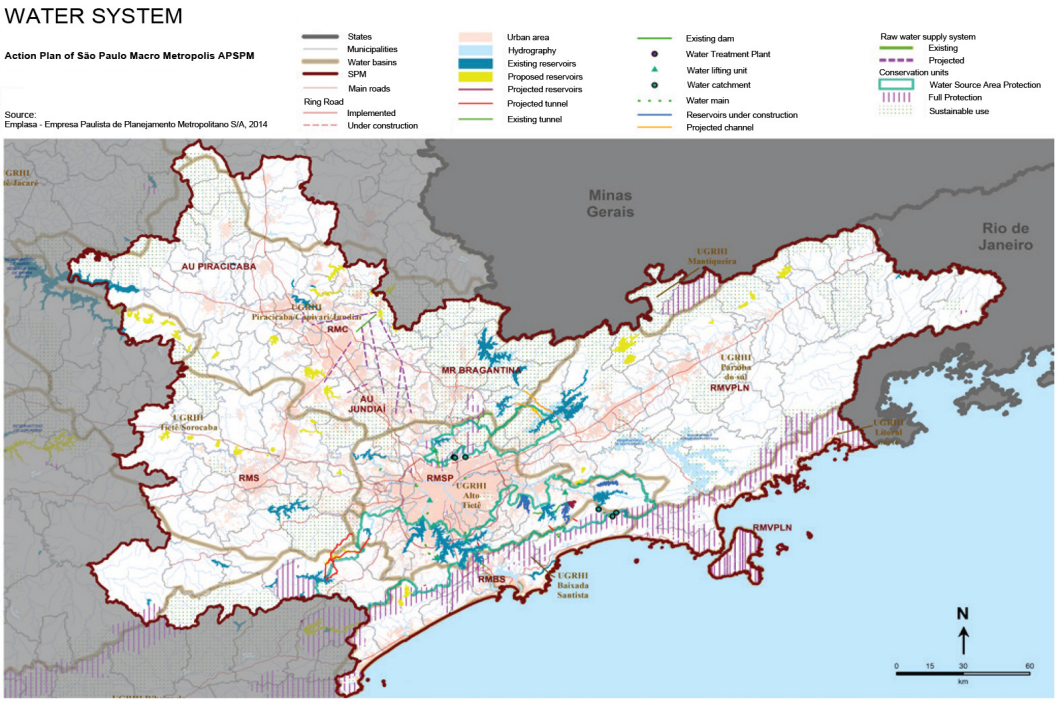


Figure 2: Water access and distribution at SPMR: Institutional arrangements though time (own elaboration)

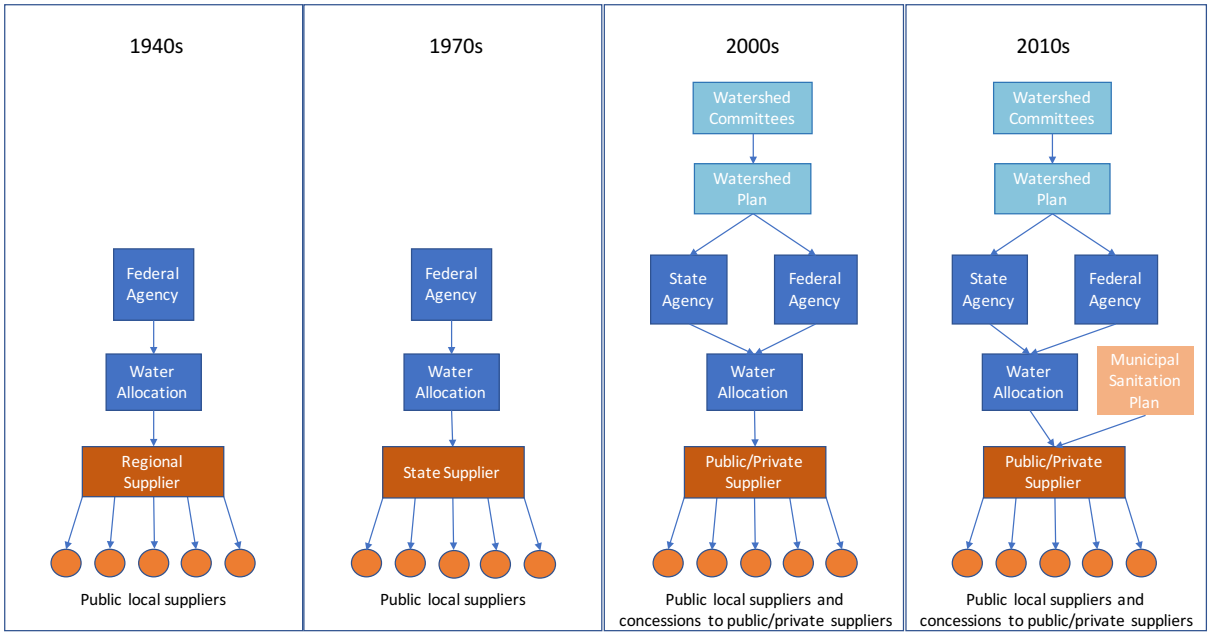


Figure 3: Interdependence between the Water Resources and Water Services governance systems (own elaboration)