International Development

ISSN 1470-2320

Working Paper Series 2016

No.16-179

Managing Water (In)security in Brazil- Lessons from a Megacity

Claudia de Andrade Melim-McLeod

Published: November 2016

Department of International Development

London School of Economics and Political Science

Houghton Street **Tel: +44 (020) 7955 7425/6252**

London **Fax: +44 (020) 7955-6844**

WC2A 2AE UK **Email: d.daley@lse.ac.uk**

Website: http://www.lse.ac.uk/internationalDevelopment/home.aspx

Managing Water (In)security in Brazil- Lessons from a Megacity[1]

Claudia de Andrade Melim-McLeod

Abstract

This paper discusses the 2013-2015 water crisis in São Paulo from a water governance perspective and seeks to offer an explanation for the crisis by exploring the political and administrative decisions that contributed to it. It aims to uncover the rationale behind the decision making processes that, combined with drought, led to increasing water scarcity, with a view to understanding how political economy factors impact water security in a megacity such as São Paulo. It argues that under some circumstances, elections do not promote accountability, but rather may act as an incentive to undermine it. Finally, it makes recommendations with a view to institutionalizing greater accountability, averting future crises and adapting to increased water insecurity under changing climatic conditions.

Introduction

As a concept, water security is subject to much debate, and the term has been used in the context of very distinct analytical frameworks in studies on topics from bio-terrorism to public health (Cooker and Bakker 2012). For the purposes of this study, however, water security is defined as "the capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability" (UN-Water 2013).

While such capacity can be threatened for a variety of reasons, climate change can aggravate the dimensions of the problem in a number of ways. As Conway notes, "[h]owever water security is defined, it is clear that through potentially rapid and large changes in socially critical aspects of the hydrological cycle, climate change represents a major cross-cutting challenge, in terms of availability, exposure to hazard, management capacity (supply and demand), and individual well-being" (Conway 2013: 80-81).

Most recent climate change studies, including the latest report by the Intergovernmental Panel on Climate Change on Water (IPCC 2008) focus on the physical changes that particular locations are undergoing or the solutions necessary to address water insecurity. In the case of drought, possible adaptation interventions include water rationing, desalination plants, water reuse technologies, investments in climate-smart agriculture, etc. However, *the vested political and economic interests* that underpin the choice of adaptation interventions adopted, and how effective they are for the populations concerned, are not frequently discussed. This is the subject of this paper.

From 2013 to 2015, Brazil faced a severe water crisis. The country had its worst drought in 84 years, which led 1,485 out of its 5,561 municipalities to declare a state of emergency (Targa and Batista 2015). The drought affected over 20 million people in the São Paulo Metropolitan Area (SPMA) alone as the volume of the city's main system of reservoirs started to decrease in mid-2013, and was depleted in the following year (Coutinho et al. 2015). As a consequence, millions of residents, particularly the poorest, were deprived of regular water supply for several

[1] Leal Filho, W et al. (Eds) *In* Climate Change Adaptation in Latin America: Managing Vulnerability, Fostering Resilience. Springer. Publication forthcoming.

months, due to strict water rationing imposed by the state government.

The purpose of this paper is to provide an answer to the question "What caused the water crisis in São Paulo?" from a political economy perspective, and to scrutinize the rationale for the adaptation measures taken by the state government. While the governor of São Paulo blamed climate change for low rainfall and subsequent disruptions in the water supply and the media focused on the drought (Jacobi et al. 2016) as the main reason behind water scarcity, a number of studies have discussed the consequences of near-sighted urban planning, poor decision-making and governance failures as the main causes behind the water crisis: Anelli (2015) provides a historical overview of the current urban landscape and explains how past decisions make sanitation a major challenge in São Paulo, Martins et al. (2015) analyse the crisis from a human rights perspective, and Jacobi et al. (2015) discuss failures in governance as well as in participation and social accountability structures.

The paper complements this body of work by analysing how these factors have amplified pre-existing dysfunctions in the water governance system to worsen the effects of the drought and deprive a significant part of the population of water. Furthermore, it discusses how democratic elections have contributed to fostering lack of accountability, rather than promoting it, as is widely assumed by international development academics and policymakers (Sen 1999, Carothers 2002, ODI 2007, UN 2009).

In doing so, it will identify the causes of the crisis by disaggregating its main building blocks, which include climate-related factors, urban growth, the water governance framework and the roles of the São Paulo water utility company Sabesp and the state government. Further, it will demonstrate that policy choices were underpinned by political considerations and that the lack of transparency and failure of accountability structures within the government itself played a significant role in failing to prevent the crisis. It will conclude with a discussion and recommendations to address the failures identified and contribute to averting future crises in São Paulo.

Methodology and Constraints

The present paper is based on research carried out at the London School of Economics' Department of International Development, where the author was a Visiting Senior Fellow from November 2015 to September 2016. An initial literature review of secondary sources was complemented with interviews conducted between March 29 and April 20, 2016 with key informants from the University of São Paulo (USP), Sabesp, the São Paulo state government, the NGO umbrella organisation Aliança Pela Água, Associação Águas Claras do Rio Pinheiros, the Ethos Institute, Fundação Getúlio Vargas, Greenpeace, the Federation of Industries of the state of São Paulo (FIESP) and the Piracicaba Capivari Jundiaí (PCJ) River Basin Committee, as well as group discussions at the Workshop on Decision Making for Climate Change Risks and Management, held at the University of São Paulo Institute for Energy and the Environment on April 12-13, 2016. Findings from the field work were then triangulated with 2014 and 2015 newspaper and online media articles between April and July 2016.

It is important to note that there are other issues that are key to ensuring effective governance of water resources, such as pricing mechanisms, early warning systems, citizen awareness, and the role of the media and of citizens'groups. However, they are beyond the scope of this paper and will not be addressed here.

1. Managing Water in a Growing City: A Historical Overview

There is by now widespread consensus among the scientific community that climate change is happening and that it is going to affect water security around the world, including in Brazil (IPCC 2008, PBMC 2012, SAE 2015). A series of scientific studies commissioned by the Brazilian Secretariat of Strategic Affairs shows that 2010 precipitation levels could decrease up to 55% by 2040 and by 85% by 2100 (SAE 2015).

Brazil has approximately 12% of the freshwater of the planet, across 200,000 micro basins. The country's resources should be sufficient to provide 19 times the amount of water for its entire population of 204 million, based on the UN standard of 1,700 m^3 per second per capita annually (MMA 2016). However, they are unevenly distributed and only 20% of its water is available in the Southeast, South and Northeast regions, which concentrate 78% of the population (IBGE, 2011 quoted in Targa and Batista 2015).

The SPMA is currently served by systems of independent reservoirs which together, supply water to over 20 million people. The largest of them, the Cantareira system, produces 31 $m^3$of water per second under normal operating conditions, of which 24,8 m^3 are destined to human consumption, and the remainder is used by the agricultural and industrial sectors. However, the drought led its volume to decrease exponentially from mid-2013 and by July 2014 the reservoir had been depleted (Coutinho et al. 2015).

The year of 2014 has been the driest in the history of São Paulo since metereological data started to be collected in 1930 (Sabesp 2014). Low rain levels, however, were only part of the reason for the water crisis. A much earlier contributing factor is found in the decision-making processes that originated in the 1920s, when urban planners sought to maximize residential areas and roads to serve a growing urban population. Rivers were first channelled, then covered so the sewage systems into which they were transformed would remain conveniently hidden and out of sight. This practice remained and was institutionalized as a public policy in the 1970s. It was therefore not the consequence of a random process of urban growth, but rather of deliberate decisions to manage water resources in order to prioritize housing and transport sectors and serve the urban population needs for easy waste disposal (Anelli 2015).

In the 1960s and 1970s the city's population grew exponentially as a result of rapid economic growth and the industrialization process, which attracted migrants from other regions in Brazil, mainly the poorer North-eastern states. In the absence of affordable housing, migrant workers occupied the city's surrounding areas, including officially designated *áreas de preservação permanente*, or "permanent conservation areas" where springs for the rivers serving the city were located. These illegal occupations became large slums without any sanitation infrastructure, which led to the pollution of nearby water sources, compromising the quality of their own drinking water and that of downstream city dwellers (Silva and Porto 2013).

In order to address the many problems brought about by rapid urbanization and manage the city's water resources in a sustainable manner, more integrated planning involving the housing, transport and water sectors was required. This was first attempted in the 1970s through legislation that sought to integrate water resource management and urban planning, but to no avail. As more and more migrants settled in the conservation areas, the military government's response was at first to remove them by force.

When Brazil became a democracy again in 1985 following 21 years of military rule, there was a shift in urban planning toward improving conditions in these areas. A number of

infrastructure, housing and water cleaning programmes were implemented from the 1990s onwards in order to provide some infrastructure to slums near springs, limit the pollution of water sources areas, move other slums away from streams and recuperate polluted streams (Anelli 2015).

However, demand far outstripped supply and by 2003, the fastest growing illegal settlements were located in spring protection areas, bringing domestic sewage and chemical waste directly into springs, and jeopardizing the use of water for human consumption. In addition, more roads were built over areas that were previously occupied by rivers in order to provide additional sewage outlets for a growing population.

By 2013, the SPMA had over 20 million inhabitants, and illegal settlements in protected areas had mushroomed to become a threat to water sources. Furthermore, deforestation in areas surrounding the city has also contributed to water insecurity, as forested areas helped build stocks of groundwater that contributed to nearby reservoirs. In some areas near reservoirs, cattle farms replaced forests, adding another layer of complexity and another priority – food security - to decisions regarding land use.

The fact that water and sanitation, housing, transport, agricultural and industrial sectors are housed in different departments at municipal and state levels represents enormous challenges to the integrated management of water resources. In addition, even within the water sector, present governance arrangements make coordination difficult at the municipal, state and national levels, as will be explained below.

2. Responsibilities for Water Governance at Local, State and Federal Levels

The right to water was officially recognized internationally by the United Nations General Assembly in 2010 (UN 1992). The Brazilian legal framework reflects the universal right to water in several instances, at the federal, state and municipal levels. Paradoxically however, the plethora of public institutions involved in ensuring that good quality water is accessible to all, can in times of crisis contribute to ensuring that it is not. This happens partly due to overlapping mandates, partly due to political reasons.

After the demise of military rulers, Brazil adopted a new Constitution in 1988. The Constitution protects both human rights and natural resources, including water resources. Article 225 defines the environment as a public good and states that public authorities have a duty to defend it and preserve it for present and future generations. Article 23 XI states that registration, monitoring and supervision of water concessions and licenses are the joint responsibility of the federal, state and municipal governments (Brasil 1988).

According to the Constitution, the federal government owns water resources such as rivers and lakes that cut across more than one state or that constitute a border with another country, as well as the rights to the hydroelectric power that may be derived from them, although states are granted a share of the revenues. States on the other hand have jurisdiction over water within their own territory. Either way, the legal nature of water is that of a public good and in case of scarcity, federal and state authorities must ensure that priority is given to human and animal consumption (Brasil 1988).

The responsibilities for water management are divided thus:

Level	**Responsibilities**

Federal Government	- Manages the implementation of the National Water Resource Policy and the National Water Resources Plan - Supervises the management of water resources through the Ministry of Environment and the National Water Agency *(Agência Nacional de Água)* - The National Council of Water Resources regulates relevant policies with representatives from the Federal Government, states, the Federal District (Brasilia), various sectors and civil society representatives - Manages federal and interstate River Basin Councils - Monitors water quality through the National Agency of Health Control (*Agência Nacional de Vigilância Sanitária*)
States	- Are responsible for water management within their territory - Formulate legislation for their territory - Set up a State Council for Water Resources and ensure the functioning of River Basin Committees (with representatives from the state government, the private sector, and civil society) within their jurisdiction - Monitor the quality of water for human consumption through the State Agency for Health Control
Municipalities	- Manage the integration of policies related to the environment, land use and conservation and sanitation with federal and state water resources policies. - Have seats at River Basin Committees in order to promote inter-sectoral and federal policies with local policies - Monitor the quality of water for human consumption through the Municipal Health Agency

Source: Aith and Rothbarth (2015:169)

As the table above shows, there are a number of policies and laws regulating the management of water resources at various levels. The legal framework itself is complex and an analysis of it is beyond the scope of this paper, but two laws in particular merit attention. Law 9.433/1997 provides for the management of water in a decentralized and participatory manner through River Basin Committees (Presidência da República 1997). These have representatives from state and municipal governments, the private sector, civil society, academia and representatives from user groups, industry, agriculture, etc. Thus, each river basin is the primary unit where water resource planning is carried out and this gives River Basin Committees a critical role because they are meant to be a forum for policy coordination that connects different municipalities (each having its own locally elected government), across a common river basin. It also connects state-level actors, in cases where the same river basin is shared by two different states (Aith and Rothbarth 2015).

The other key piece of legislation for the purposes of this paper is Law 11.455/2007, known as the Sanitation Law (Presidência da República 2007). The law establishes national guidelines for basic sanitation, including the set of services, infrastructure and facilities needed for ensuring the supply of clean water, sanitation and sewage systems, solid waste management and the management of drainage and rain water in urban areas. However, it lacks a clear definition on ownership for sanitation service provision, which may lead to overlaps in the roles of states and municipalities. This leads to problems in service delivery, as the 'owner' of the

service is also in charge of formulating public sanitation policies and of regulating and providing or delegating the provision of such services (Aith and Rothbarth 2015).

In order to understand the implications of the water management system to service provision, it is important to keep in mind that Brazil is a federation where fiscal, administrative and political powers are fully decentralized. It has 26 states excluding the Federal District where the capital Brasilia is located, and over 5,000 municipalities. Therefore, when national, state and municipal government offices are held by different political parties, the type of collaboration and collegial decision making envisaged in the Constitution become all but wishful thinking in practice. More often, relationships between national, state and municipal authorities can be tense and adversarial depending on their political affiliation and alliances.

For example, the state-run water utility company Sabesp should provide sanitation services in roughly half of São Paulo's 645 municipalities, but Sabesp depends on municipal sanitation plans being available and approved (Sabesp 2016). In municipalities that are run by a mayor belonging to a different party from that of the state governor, there is deep suspicion to hand over sanitation services to Sabesp and as a consequence, integrated planning becomes very difficult.

Therefore, although state and municipal water governance constitutional responsibilities are grounded in good intentions from the point of view of revenue sharing, widening participation and fostering inclusion in decision making processes at the local level, their implementation is difficult due to the multitude of stakeholders and regulations involved, which leads to a series of dysfunctions. These, in turn, present major obstacles to the type of coherent water management that would be needed to safeguard water supply in times of scarcity and prevent a full-blown crisis as the one observed in São Paulo in 2013-2015.

3. Anatomy of a Preventable Crisis

There is a recent and growing body of literature on how the water crisis could have been alleviated, if not prevented altogether, with better planning and a different approach to the management of water resources (Côrtes et al., 2015; Martins et al. 2015; Jacobi et al.2015).

Over the past years, the availability of spring water and the capacity of water treatment stations has decreased, leading to less water availability per capita, and the water supply system has been working above their operational capacity, particularly in the hottest months of the year (Côrtes et al. 2015). Moreover, several meteorological stations in Brazil monitor the El Niño and La Niña phenomena, and can therefore make projections on the rainfall to be expected. By heating or cooling the waters in the Pacific Ocean, these phenomena would normally lead to an increase or decrease of rainfall in the southern part of Brazil, respectively, and affect the SPMA, albeit with less intensity. Given that prognostics for the phenomena are available at least six months in advance, by mid-2013 it was already known that the Cantareira system would fail to deliver water for its 9 million users in the second half of the year (Côrtes et al. 2015). Indeed, there have been studies and warnings on the need to preserve water resources in São Paulo since the 1970s (Jacobi et al. 2015).

In 2015, a report by the State Audit Institution (*Tribunal de Contas*) of São Paulo concluded that decisions could have been made to prevent the aggravation of the crisis and its impacts and stated that the state governor "should have taken measures for the effective prevention and protection from extreme hydrological events" and recommended the development of an emergency plan to handle water scarcity risks (Martins et al. 2015:6).

During the water crisis, however, none of the existing structures with a coordination role were used to develop such a plan, according to the key informants interviewed. The State Council for Water Resources was bypassed and the state government did not call on its members to discuss the crisis. Rather, a "Crisis Committee" was appointed by the state governor with carefully chosen members from different camps (Pio 2016). River Basin Committee members were not included in the governor's Crisis Committee and the criteria for membership in it was never made public. A leading water security expert at the University of São Paulo said that the government "deliberately hid the gravity of the situation from the population" (Jacobi 2016).

The bypassing of existing coordination governance structures at local and state levels is identified by civil society representatives as one of the most salient governance failures during the crisis (Martins et al. 2015, Pio 2016, Whately 2016). Why did an elected state official choose to ignore his own State Council, which had legitimacy and broad representation from different sectors? Part of the answer lies in that the main water utility company in the state as well as its own regulatory agency are accountable to the governor himself, and they are key pieces of the puzzle leading to the aggravation of the crisis.

3.1 The São Paulo State Water and Sanitation Company - Sabesp

The São Paulo State Water and Sanitation Company (*Companhia de Saneamento Básico do Estado de São Paulo)*, known as Sabesp, was created in 1973 under military rule, as a public company. In 1994, nearly 10 years after redemocratization and the wave of privatizations that followed, the company opened for private investment and in 2002, it was listed in the New York Stock Exchange. The company has a monopoly to sell water and provide sanitation services in 364 of the state's 645 municipalities, including in the SPMA.

Unlike other companies in key sectors, there was no regulatory agency enforcing minimum quality standards or compliance with legal norms until 2007, when the São Paulo State Regulatory Agency for Sanitation and Energy (*Agência Reguladora de Saneamento e Energia do Estado de São Paulo)*, ARSESP, was established under the state Water and Energy Department.

However, a critical accountability failure for the enforcement of legal norms lies in the fact that the state government is Sabesp's majority shareholder with 51% of shares and it is also responsible for the nomination of ARSESP leadership, which constitutes a clear conflict of interest. If Sabesp fails to deliver quality water or comply with the sanitation law, the regulatory agency ARSESP should step in, play its oversight role, and enforce compliance with the relevant legal norms. But ARSESP also reports to the state governor, so its effectiveness only goes as far as the governor's willingness to hold Sabesp accountable.

The limited effectiveness of ARSESP was evidenced by its inability or unwillingness to enforce a 2004 requirement by the state Water and Energy Department for Sabesp to carry out studies and projects to reduce the dependency of the company to supply water on the Cantareira reservoir. The first version of such a study was submitted in 2006 and deemed incomplete by the Department. Additional studies were requested and they were only submitted in 2014, when the reservoir had been all but depleted. In addition, Sabesp failed to deliver on its contractual commitments to provide sanitation services – while still charging consumers for them - and clean the water in key river basins that supply the reservoir and was neither held accountable by the Water and Energy Department nor by ARSESP;

Currently, in the state of São Paulo, 10% of all sewage is not collected and 39% is not treated

(Martins et al. 2016). Explaining Sabesp's position, a manager in the company clarified that "Sabesp depends on municipal authorities, as only they can approve sanitation plans for us to implement. Very few actually have those plans. We cannot build infrastructure in conservation areas… if we do that, the Public Prosecutor's Office (*Ministério Público*) will come after us"(Sabesp 2016).

On the of the main measures taken by Sabesp to address the crisis was to encourage reductions in household consumption. In February 2014, the company announced discounts in tariffs for households that reduced their consumption by 20% in relation to the previous year. Other measures consisted in bringing in water in from the Paraíba do Sul river, shared by the Rio de Janeiro and São Paulo states through expensive river transposition work, curbing the loss of water through pipe leaks, and using the so-called "technical reserve" from reservoirs in order to extract the amount of water at the bottom that requires special pumps. According to Sabesp, two water treatment stations had their capacity increased and 13.7 million m^3 of "reused water "(water that has not been treated as to be fit for human consumption but that can be reutilized for other uses, for example cleaning) were sold in the SPMA in 2013 (Sabesp 2014).

However, in June 2014, it emerged that Sabesp had invested less than it had planned in sanitation infrastructure to increase the water supply between 2008 and 2013, which could have minimized the impact of the crisis. This led Catarina de Alburquerque, the United Nations Special Rapporteur on the human right to safe drinking water and sanitation, to attribute responsibility for the water crisis to the state government, naming lack of planning, investment, and actions to reduce leakages which led to losses estimated at 35% (Jacobi et al. 2015)

By mid 2014, Sabesp began interrupting the supply of water in the poorest areas of the city, without previous communication to households, in breach of the national Sanitation Law. Those who complained were told that the system was undergoing maintenance. When interruptions reached middle class households, the company confirmed it had reduced water pressure in its pipes through special valves. Even in the face of ample evidence that some areas had no water for several days, the company never admitted carrying out cuts in the system. It was eventually forced to do so when the Brazilian Institute for Consumer Protection (*Instituto Brasileiro de Defesa do Consumidor*) got involved and the Access to Information Law was invoked to force Sabesp, ARSESP and the State Government to provide information on water cuts (Martins et al 2015).

In November 2014, Sabesp increased water tariffs by 6.49% and initiated a policy of providing discounts to consumers who saved water as well as issuing a fine to those who used more. This successfully decreased water consumption in 82% of households (Sabesp 2014). In May 2015, another tariff readjustment of 15.24% was requested by the company to ARSESP in order to "balance accounts". This enabled the company to pay its shareholders dividends in the order of BRL 252.3 million (approximately USD 100 million) in 2013 (Martins et al. 2015) although the main product it sold – water- had become scarce and "discounts" were offered to those consumers who saved water throughout the municipalities it served.

3.2 The State Government

Although climate change, poor land use planning, overlapping legal mandates and Sabesp's own interests played an important role leading up to the water crisis, the single most damaging factor was perhaps the response of the state government to cope with the drought.

In 2011, Geraldo Alckmin won the election for governor of the state of São Paulo with 50.63% of the vote. Alckmin, who started his political career in 1973 as a local councillor, is at the time of writing a strong contender for the nomination of his party, the Brazilian Social Democracy Party – PSDB (*Partido da Social Democracia Brasileira),* to the 2018 presidential elections. Rather than espousing the same type of left wing ideology of its European counterparts with similar names, PSDB is viewed as a right-wing party in Brazil.

Adding to all the factors that contributed to the aggravation of the water supply in São Paulo, Alckmin's efforts to be re-elected and deliberately misleading the public with regard to the situation of the state's water resources had particularly devastating consequences.

As mentioned above, the state Water and Energy Department had sounded the alarm as early as 2004 regarding the need to invest in the water supply system in order to meet growing demand, and state guidelines for water resources (*Plano Diretor de Aproveitamento de Recursos Hidricos para a Macrometrópole Paulista*) published in 2013 pointed to the need of increasing supply and formulating an emergency plan with well-structured measures, with examples from other countries (Jacobi et al. 2015).

However, none of this was done. In September 2014, the President of ANA, the National Water Agency, intervened and declared that the management of the crisis in São Paulo was putting the water supply for 2015 at risk and that there was "no effort to communicate the gravity of the situation to the population." He criticized Sabesp for failing to put in place an emergency plan to address the crisis, and accused the State Secretary for Water Resources of merely putting in place measures "to gain time" (Gomes 2014).

Indeed, admitting that there were serious problems in the management of water resources in the state that would lead to an interruption of the water supply for 20 million voters and consumers would have presented a blow to Ackmin's re-election campaign as well to Sabesp's shares – 51% of which he controlled through the state government. For these reasons, in spite of warnings and intense questioning from ANA, experts, civil society and the media, Alckmin blamed "climate change" for the crisis until throughout his campaign (RBA 2014) and denied that water rationing would be necessary.

Having deliberately withheld information from the public as to the seriousness of the water scarcity and the rationing that was already being unofficially implemented (Jacobi et al. 2015, Martins et al. 2015), Alckmin circumvented existing government structures and laws, and was re-elected governor in November 2014 with 57% of the vote. Water rationing was officially announced shortly after.

4. Evading Accountability in a Democracy

The idea that that democracies can ensure government accountability to citizens through regular elections is common among development practitioners and agencies. In a critique of the enthusiasm of Western policymakers and donors for elections held as part of the re-democratization of Latin America and other regions in the 1980s, Thomas Carother writes:

"Democracy promoters […] have tended to hold very high expectations for what the establishment of regular, genuine elections will do for democratization. Not only will elections give new postdictatorial governments democratic legitimacy, they believe, but the elections will serve to broaden and deepen political participation and the democratic accountability of the state to its citizens" (Carothers 2002 pp.7-8).

A similar assumption has been advanced by Amartya Sen, who has famously claimed that ”no substantial famine has ever occurred in any independent and democratic country with a relatively free press” (Sen 1999 pp.7-8). Sen also argues that ”[f]amines are often associated with what look like natural disasters, and commentators often settle for the simplicity of explaining famines by pointing to these events: the floods in China during the failed Great Leap Forward, the droughts in Ethiopia, or crop failures in North Korea. Nevertheless, many countries with similar natural problems, or even worse ones, manage perfectly well, because a responsive government intervenes to help alleviate hunger” (Sen 1999 p.8).

However, there are several problems with the notion that elections will necessarily lead to ‘accountability of the state to its citizens’, which would be a key feature of a ‘responsive government’.

First of all, famines *have* occurred in democracies, as has been demonstrated by Olivier Rubin, in his analyses of famines in India, Malawi and Niger. Rubin has also argued that the plurality of political actors and competition for political office that are inherent to democracy can actually present disincentives to acknowledge famines and take action to address them. In the case of the 1967 famine in Bihar, India, he points out that “declaring a famine immediately before the election could give the impression of an incapable State Government – in particular if the declaration of famine was not followed up with the necessary resources” (Ruben 2009 p.705).

Intuitively, it can be easy to assume that elections indeed promote the accountability of leaders vis-à-vis citizens. In theory, they provide voters/citizens with a mechanism to make political leaders accountable for their actions in office and to replace them if these actions are not seen as being in the interest of voters. But in practice, this does not always work – as the case of São Paulo shows. As Rubin put it, declaring an emergency before an election does not look good for political office incumbents seeking re-election.

In the case of São Paulo, it can be reasonably assumed that if Alckmin had not been under pressure to become re-elected, he might have heeded warnings on the impeding water scarcity and taken measures to manage the water supply to the city before it became it became seriously threatened.

Secondly, Sen’s assumption that a free press will enable voters to make informed decisions before elections and replace unresponsive governments is equally inaccurate in the case of São Paulo. Although the media in Brazil is independent and free, over half of all news articles published at the height of the crisis portrayed the crisis largely as a result of the ongoing drought. An analysis of media coverage carried out by the Instituto Democracia e Sustentabilidade, a non-governmental organization, showed that 55% of all news articles published between January and October 2014 considered the drought as the main cause for the water crisis between January and October 2014, as opposed to 16% that cited poor management of resouces. Other causes mentioned included lack of information, climate change, deforestation, land use change, an increase in population numbers, leakage and waste. Between October 2014 and February 2015, 40% of news stories placed the blame for the crisis on the drought and 24% on poor management, respectively (IDS 2016).

Thirdly, the existence of several levels of elected officials can also constitute an obstacle to accountability. Another important point made by Rubin is that the multitude of institutions at

various levels may make it difficult to assign responsibility for governance shortcomings in a democracy. As he points out, "Accountability is an essential component for democratic pressure. However, it is not always straightforward to identify accountable decision makers in a democratic political system. Such a system can very well consist of a complex web of democratic institutions, many of which might have mutual/overlapping powers of authority" (Rubin 2009 p. 711).

Indeed, in São Paulo, the existence of various bodies responsible for water governance and supply, including Sabesp, ARSESP and state/municipal councils made it difficult to assign responsibility and hold those responsible to account for poor planning.

Finally, even in a democracy, the bypassing of established structures and norms in 'emergency' situations is often used as a means to legitimize and evade accountability for actions that would otherwise have to be subject to public scrutiny. Keen (2012) provides a number of examples from Sri Lanka to the United States, showing how the 'politics of permanent emergency' have included measures to justify the unjustifiable and silence dissent. Quoting Giorgio Agamben, Keen notes that in such situations "[...] the exception does not subtract itself from the rule; rather, the rule, suspending itself, gives rise to the exception" (Agamben 1999 p.18, quoted in Keen 2014 p.4).

The same tactics were used by the democratically eleted government of São Paulo. Although there was no famine as such, a non-responsive government hid cynically behind the veil of "climate change" until just before elections. Then, one month after taking office, Alckmin announced the extraordinary creation of a Water Crisis Committee *(Comitê da Crise Hídrica)* mentioned in section 3, in order to facilitate "information exchange and the planning of joint actions" (De Araújo 2015).

However, the Water Crisis Committee was criticized by both local government authorities and civil society for failing to do so - and for its lack of transparency and accountability (De Araújo 2015). Shortly after the Committee was established, the civil society umbrella organisation *Aliança Pela Água*, representing 40 civil society organisations, issued a "Call to Action on the Water Crisis" including demands to form a task force with government and civil society representatives (Aliança Pela Água 2015), but to no avail.

The Water Crisis Committee did not take into account demands for more openness and inclusion, and presented its own emergency plan to members consisting of representatives from the state government, selected mayors and Sabesp behind closed doors, five months after its plan had been formulated (Leite 2015). River Basin Committees were not consulted.

Thus, in the case of São Paulo, the state governor chose to nominate a body to handle the crisis on an exceptional basis rather than use the existing State Water Coucil, whose mandate it is to coordinate water management at the state level. In practice, this represented an accountability breakdown in relation to established channels, whilst providing the governor's own ad-hoc Committee with a façade of legitimacy and himself with credit for taking action in the face of a crisis.

Rather than acknowledging its failure to take preventive action, using the State Water Council to discuss possible responses or empowering ARSESP to play its oversight role, the Alckmin government chose to first downplay the water crisis and later, manage it "by exception" – in

both cases eluding both vertical (through elections) and horizontal (vis-à-vis other government institutions) accountability. Hence, the holding of elections acted as a driver to evade accountabiltity rather than enforce it.

Accountability failures notwithstanding, this is not to say that the absence of elections would be preferable as a means to guarantee a responsive government and better crisis management. In spite of the problems experienced, the water crisis has helped galvanize action by civil society organisations monitoring water and environmental governance, and it has also raised citizen awareness on the importance of water as a finite resource. These two factors may lead to a closer scrutiny of government actions than has been the case to date, both by the media and citizens/voters – which could not happen in an undemocratic country without a free press and where freedom of association is prohibited.

With the city's water reservoirs restored, whether the state's political leaders will be able to evade electoral accountability in the future or whether they will be tempted to bypass existing accountability structures and 'govern by exception' will depend on precipitation levels, and critically, on how the media and citizens perceive the management of water resources. Judging from the recent crisis and the nature of media coverage, democracy and a "relatively free press" may not be enough to address poor governance and prevent vested interests from being key elements in decision-making.

5. Conclusion: Lessons Learned and the Way Forward

There is now ample evidence that there had been plenty of information about the prognostics of reduced rainfall in São Paulo in the summers of 2013-14. However, rather than invest in water treatment and sanitation for locally available water, the state government and Sabesp chose to carry out extensive public works to bring water from other river basins. This raises questions about the long-term sustainability of adaptation interventions chosen, and whether having a water utility that has a monopoly over water supply and sanitation and must yield a profit to its shareholders is the best model in water scarce environments.

In spite of a robust legal framework and of institutions on various levels mandated to enforce it, as well as democratic elections and a free independent press, the São Paulo crisis left millions without regular water supply for months. The explanation for the shortcomings in actually leveraging the knowledge, rules and institutions available lie in the political economy of water governance in the state, and the various interests and incentives at play that prevented – and still prevent - a coherent approach to the problem and the development of sustainable solutions.

As discussed above, this is due to a series of distinct, yet inter-related factors, which can be grouped under two main sets of issues:

Policy Coherence and Coordination

- *Lack of affordable housing and growing migration,* leading to large illegal settlements in areas where water springs are located and jeopardizing the availability of water that feeds critical reservoirs;

- *A system of governance that would require seamless collaboration* between municipalities, cities, state and national level actors to be effective – which, in face of political tensions between political leaders at these levels, becomes difficult in practice;
- *Lack of effective coordination* between municipalities, the state government and Sabesp, particular with regard to the provision of sanitation services and emergency measures to tackle the crisis;

Conflict of Interest and Accountability

- *Conflicts of interest within the state government*, which oversees the water regulatory agency ARSESP while being the majority shareholder of the public-private water utility company Sabesp;
- *Sabesp's prioritization of investments in public works and river transposition* to ensure water supply, rather than invest in sanitation services and water recycling;
- *Lack of transparency and accountability on the part of the state government,* which has failed to communicate the gravity of the crisis to the population and to involve existing bodies such as River Basin Committees or the State Water Resource Council in devising solutions to the 2013-2015 crisis and strategies to cope with water scarcity in the future.

The water crisis is structural and climate models predict water scarcity for years to come (IPCC 2008). Therefore, averting future crises will require the following:

Enforcement of environmental protection norms, to protect or reforest conservation areas near rivers and reservoirs, and ensure that water springs can continue to feed them with high quality water. At state and municipal levels, there needs to be policy coherence and budgetary allocations to manage water security, housing, and environmental priorities;

Specific provisions on water scarcity management in the State Plan for Water Resources and *integrated crisis management between state and municipal governments, and River Basin Committees* irrespective of the political party in power at different levels, to ensure coherence in interventions made above party politics;

A prominent role for the State Council on Water Resources and River Basin Committees in Sabesp's planning and decision-making. These participatory bodies enjoy legitimacy, ownership, and broad representation. Their mandates and local knowledge must be leveraged so they play an active role with regard to early warning systems and setting up any required emergency measures;

More investments in sanitation, less in public works. According to the Sanitation Law, sanitation concession rights must include provisions for emergency sanitation services in all municipalities but many municipalities lack these plans altogether. The São Paulo municipality Plan of 2010 is outdated and has no contingency measure. The state government, municipalities and Sabesp need to work together to implement legislation on sanitation as a priority;

A firewall protecting ARSESP, the water regulatory agency, from interference from the state government. A system where a public-private water utility and its government regulator report to the same entity that controls 51% of the shares of the company has structural flaws in the checks and balances necessary to ensure accountability. As long as Sabesp has a monopoly in SPMA and the government accumulates the functions of water provider and shareholder (through Sabesp) and regulator (through ARSESP), this is unlikely to change. ARSESP should not report to the state governor through the Water and Energy Department, but rather, a Board

or an existing independent, multi-stakeholder body such as the State Council on Water Resources;

Continued efforts to promote citizen awareness. Citizens have demonstrated that they can reduce their consumption significantly when given the proper incentives. It is important to continue to offer discounts in tariffs for reduced consumption, stimulate water recycling and promote awareness in schools and the work place.

The São Paulo water crisis shows that when designing responses to deal with severe weather events, it is important to look at the governance structures and decision making processes and ensure that they are made more apt to handle water scarcity in order to increase resilience.

It is often challenging to draw replicable recommendations from isolated case studies, as every context has its specificities. However, the case of São Paulo shows that the rationale and choice of climate change adaptation interventions adopted by governments needs to be scrutinized in detail to ensure that solutions are efficient and satisfy the needs of the population that they are intended to serve in the long term.

References

Aith F, Rothbarth R (2015) O estatuto jurídico das águas no Brasil. Estudos Avançados, 29(84). Available at http://dx.doi.org/10.1590/S0103-40142015000200011. Accessed 20 June 2016.

Aliança Pela Água (2015) Chamado à Ação para a Crise Hídrica: Por um Plano de Emergência para a Cidade de São Paulo. Available at https://www.sosma.org.br/wp-content/uploads/2015/02/Chamado-a-Acao-Plano-de-emerg%C3%AAncia.pdf. Accessed 30 July 2016.

Anelli, R (2015) Uma nova cidade para as águas urbanas. Estudos Avançados, 29(84). Available at http://dx.doi.org/10.1590/S0103-40142015000200005. Accessed 15 June 2016.

Araújo, P (2015) Nem Privada nem pública nem nada: a estranha história da "privatização" da Sabesp, Diário do Centro do Mundo. Available at http://www.diariodocentrodomundo.com.br/nem-privada-nem-publica-nem-nada-a-estranha-historia-da-privatizacao-da-sabesp/. Accessed 20 June 2016.

Agamben, G (1999) Homo Sacer: Sovereign Power and Bare Life. Trans. Daniel Heller-Roazen. Stanford University Press, Stanford.

Brasil (1988) Constituição da República Federativa do Brasil de 1988. Available at http://www.planalto.gov.br/ccivil_03/constituicao/constituicao.htm. Accessed 20 June 2016.

Carothers, T (2002) The End of the Transition Paradigm. Journal of Democracy 13(1). pp 5-21. Available at http://www.journalofdemocracy.org/article/end-transition-paradigm. Accessed 19 October 2016.

Conway, D (2013) Securing Water in a Changing Climate. In Wolanski B et al (eds.) Water Security Principles, Perspectives and Practices. Routledge, London.

Cooker C, Bakker K (2012) Water security: Debating an emerging paradigm. Global Environmental Change no. 22 , 2012. Available at http://web.mit.edu/12.000/www/m2017/pdfs/watsec.pdf . Accessed 19 January 2016.

Côrtes P et al.(2015) Crise de abastecimento de água em São Paulo e falta de planejamento estratégico. Available at http://dx.doi.org/10.1590/S0103-40142015000200002. Accessed 20 June 2016.

Coutinho, R M et al. (2015) Catastrophic Regime Change in Water Reservoirs and São Paulo Water Crisis. Available at http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0138278. Accessed 20 June 2016.

De Araújo, T (2015) Criticado por prefeitos, Comitê de Crise Hídrica da Grande SP criado por Geraldo Alckmin é criticado pela Aliança pela Água. Available at http://www.brasilpost.com.br/2015/02/05/comite-crise-agua-sp_n_6620812.html . Accessed 30 July 2016.

G1 (2015) Crise da Água. Nível dos reservatórios. Available at http://especiais.g1.globo.com/economia/crise-da-agua/nivel-dos-reservatorios/. Accessed 20 June 2016.

Goldestein S (2015) Para combater crise da água ações imediatas não serão suficientes. Instituto Brasileiro de Defesa do Consumidor. Available at http://www.idec.org.br/em-acao/noticia-do-consumidor/para-combater-crise-da-agua-aces-imediatas-no-sero-suficientes. Accessed 20 June 2016.

Gomes R (2014) Alckmin está comprometendo o futuro das reservas de água de São Paulo, diz ANA. Rede Brasil Atual. Available at http://www.redebrasilatual.com.br/politica/2014/09/gestao-da-crise-da-agua-pelo-governo-alckmin-esta-comprometendo-o-futuro-diz-ana-8508.html. Accessed 20 June 2016.

Jacobi et al. Crise da água na região metropolitana de São Paulo. GEOUSP: Espaço e Tempo, 19(3). Available at doi:http://dx.doi.org/10.11606/issn.2179-0892.geousp.2015.104114. Accessed 12 July 2016.

IBGE (2011) Instituto Brasileiro de Geografia e Estatística IBGE. Censo demográfico 2010: características da população e dos domicílios. Available at http://www.ibge.gov.br/home/estatistica/populacao/censo2010. Accessed 22 March 2015.

IDS (2016). Instituto Democracia e Sustentabilidade. Crise Hídrica e a Mídia. Available at http://ids-ecostage.s3.amazonaws.com/media/uploads/2016/06/27/infografico-crise-hidrica-e-a-midia-resultados.pdf . Accessed 30 July 2016.

IPCC (2008) Intergovernmental Panel on Climate Change IPCC. Climate Change and Water. Technical Report VI. Bates, B C et al. (eds.), IPCC Secretariat, Geneva. Available at https://www.ipcc.ch/pdf/technical-papers/climate-change-water-en.pdf . Accessed 6 July 2016.

Jacobi, P et al. (2015) Crise hídrica na Macrometrópole Paulista e respostas da sociedade civil. Estudos Avançados, 29(84). Available at http://dx.doi.org/10.1590/S0103-40142015000200003. Accessed 6 July 2016.

Jacobi P (2016) Interview with Pedro Jacobi, Universidade de São Paulo, 29 March 2016.

Leite I (2015) Governo de SP apresenta plano contra crise hídrica com 5 meses de atraso. Available at http://g1.globo.com/sao-paulo/noticia/2015/11/governo-de-sp-apresenta-plano-contra-crise-hidrica-com-5-meses-de-atraso.html. Accessed 30 July 2016.

Keen, D (2012) Useful enemies: when waging wars is more important than winning them. Yale University Press, New Haven and London.

Keen, D (2014) The 'camp' and the 'lesser evil': Humanitarianism in Sri Lanka. Conflict, Security & Development 14 (1), 1–31. Available at http://dx.doi.org/10.1080/14678802.2013.856176. Accessed 30 July 2016.

Martins, E et al. (2015) Crise hídrica e direitos humanos – Relatório de violação de direitos humanos na gestão hídrica do estado de São Paulo. Aliança Pela Água, Coletivo de Luta pela Água, Greenpeace and IDEC, São Paulo. Available at

http://www.greenpeace.org/brasil/Global/brasil/documentos/2015/greenpeace_relatorio_hidrica_A4-ALTA.pdf. Accessed 17 May 2016.

MMA (2016) Água. Available at http://www.mma.gov.br/agua. Accessed 24 January 2016.

Overseas Development Institute (2007). Voice for accountability: citizens, the state and realistic governance. Briefing Paper 31. Available at https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/576.pdf. Accessed 19 October 2016.

PBMC (2012) Sumário Executivo do Volume 1 - Base Científica das Mudanças Climáticas. Contribuição do Grupo de Trabalho 1 para o 1° Relatório de Avaliação Nacional do Painel Brasileiro de Mudanças Climáticas. Volume Especial para a Rio+20. Available at http://www.insa.gov.br/wp-content/themes/insa_theme/acervo/painelbrasileiro.pdf. Accessed 7 June 2016.

Pio (2016) Interview with Anicia Pio, Federação de Indústrias do Estado de São Paulo (FIESP), 30 March 2016.

Presidência da República (1997) Lei 9.433 de 8 de janeiro de 1997. Available at http://www.planalto.gov.br/ccivil_03/leis/L9433.htm. Accessed 6 July 2016.

Presidência da República (2007) Lei 11.445 de 5 de janeiro de 2007. Available at http://www.planalto.gov.br/ccivil_03/_ato2007-2010/2007/lei/l11445.htm. Accessed 6 July 2016.

RBA (2014) Alckmin encerra horário eleitoral gratuito culpando mudança climática por falta d'água. Available at http://www.redebrasilatual.com.br/eleicoes-2014/na-tv-alckmin-defende-se-de-crise-da-agua-e-skaf-apela-para-junho-de-2013-1865.html. Accessed 20 June 2016.

Sabesp (2014) CHESS – Crise Hídrica, Estratégia e Soluções da Sabesp Para a Região Metropolitana de São Paulo. Available at http://site.sabesp.com.br/site/uploads/file/crisehidrica/chess_crise_hidrica.pdf. Accessed 20 June 2016.

Sabesp (2016) Interview with company manager at Sabesp, 31 March 2016.

SAE (2015) Brasil 2040 Resumo Executivo. Available at http://www.sae.gov.br/wp-content/uploads/BRASIL-2040-Resumo-Executivo.pdf. Accessed 19 January 2016.

Sen, A (1999) Democracy as a Universal Value. Journal of Democracy 10(4). Available at http://www.journalofdemocracy.org/article/democracy-universal-value. Accessed 30 July 2016.

Silva R, Porto M (2003) Gestão urbana e gestão das águas: caminhos da integração. Estudos Avançados 9(47). Available at http://dx.doi.org/10.1590/S0103-40142003000100007. Accessed 20 June 2016.

Targa, M, Batista G (2015) Benefits and legacy of the water crisis in Brazil. Ambiente e Água. Available at doi:10.4136/ambi-agua.1629. Accessed 19 January 2016.

UN (2009) Governance. Available at http://www.un.org/en/globalissues/governance/. Accessed 18 October 2016.

UN(1992) Vienna Declaration. UN RES/64/292. Available at http://www.un.org/en/ga/search/view_doc.asp?symbol=A/RES/64/292. Accessed 20 June 2016.

UN-Water (2013) Water Security.. Available at http://www.unwater.org/topics/water-security/en Accessed 66 July 2016.

Whately, M (2016) Interview with Marussia Whately, Aliança Pela Água, 10 April 2016.

About the Author

Claudia de Andrade Melim-McLeod is a guest lecturer the Oslo and Akershus University College of Applied Scienes in Norway and Principal Consultant at MMC Governance and Natural Resource Management. She was a Visiting Senior Fellow at the London School of Economics and Political Science from September 2015 to September 2016.

e-mail: claudia@melim-mcleod.com