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The Rationed City: The Politics of Water, Housing and Land Use in Drought-Parched São Paulo

Daniel Aldana Cohen
University of Pennsylvania, dacoh@sas.upenn.edu

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Abstract

Specters of rationing haunt metro São Paulo. Water supplies have plunged to historic, dangerous lows. The idea of rationing has become a flash-point. The state's center-right governor has insisted that rationing be avoided at all costs and the state's profit-driven water utility has followed suit, even as dwindling water supplies are being opaquely and unequally distributed. To make sense of the situation, I propose, through an exploration of the crisis's origins and recent developments that builds on over one year of ethnographic fieldwork, a new approach to ecological scarcity. It revitalizes, in a socioecological and crisis-sensitive form, Manuel Castells's concept of collective consumption politics, with a focus on housing and land use. The question is how acute crises and longstanding socioecological struggles interact, from above and below. In São Paulo, this dilemma takes the form of housing movements' and environmentalists' longstanding estrangement, but prompted by crisis, some leaders are experimenting with cooperation. In an echo of the June 2013 bus fare protests, this fledgling coalition proposes a democratic version of rationing that goes beyond the distribution of water through pipes and that threatens broader power arrangements.

Disciplines

Environmental Policy | Environmental Studies | Infrastructure | Public Policy | Sociology | Urban Studies

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Abstract:

Specters of rationing haunt metro São Paulo. Water supplies have plunged to historic, dangerous lows. The idea of rationing has become a flash-point. The state's center-right governor has insisted that rationing be avoided at all costs and the state's profit-driven water utility has followed suit, even as dwindling water supplies are being opaquely and unequally distributed. To make sense of the situation, I propose, through an exploration of the crisis's origins and recent developments that builds on over one year of ethnographic fieldwork, a new approach to ecological scarcity. It revitalizes, in a socioecological and crisis-sensitive form, Manuel Castells's concept of collective consumption politics, with a focus on housing and land use. The question is how acute crises and longstanding socioecological struggles interact, from above and below. In São Paulo, this dilemma takes the form of housing movements' and environmentalists' longstanding estrangement, but prompted by crisis, some leaders are experimenting with cooperation. In an echo of the June 2013 bus fare protests, this fledgling coalition proposes a democratic version of rationing that goes beyond the distribution of water through pipes and that threatens broader power arrangements.

Introduction

Specters of rationing haunt metro São Paulo. Drinking water supplies have plunged to historic and dangerous lows. Overall water use has been slashed by a fifth. But the region's largest, and third-largest, supply systems still verge on collapse. Water shortages have caused repeated school closures; proliferating uncovered rainwater containers have helped triple the rate of dengue infections; water contamination due to pressure reductions has caused a spike in dysentery; the army is preparing for a collapse in supplies and has war-gamed a day-long takeover of a utility station in central São Paulo.

In the vicious political debate that has engulfed the crisis, the idea of rationing has become a flashpoint. The state's center-right governor, Gerlando Alckmin, has insisted since early 2014 that rationing would be avoided at all costs, stating, "there is not any possibility of rationing, even amidst the greatest drought in the past 84 years" (*G1*, 2/26/2014). And if rationing did occur, it would be catastrophic, with residents going two days with water and five days without. Alckmin and SABESP, the state's water utility,¹ have issued financial bonuses and penalties to encourage conservation; they have imposed daily reductions in water pressure that dry taps for hours on end, disproportionately hurting the poor. They have also insisted that these measures do not constitute rationing.

Alckmin's critics have meanwhile accused the governor and SABESP of an undeclared and unequal rationing that is punishing the poor. The issue of whether there is a *de facto* rationing of water (which the evidence supports), or whether SABESP should ration more equitably and transparently, concentrates the drought's fundamental questions: How is a suddenly scarce necessity being shared? How should it be?

It is not shocking that the government has resisted the stigma and operational risks associated with outright rationing. But at certain moments, high-level officials have suggested that rationing was just weeks away. São Paulo came within days of implementing rationing during the 2003 drought. Some cities in São Paulo's metro region, like Mauá and Guarulhos, not directly served by SABESP, have undergone outright rationing, with water service regularly shut off for days at time. So have dozens of cities in the country's north-east, and so has Puerto Rico's San Juan.² Rationing is politically problematic, but it is plausible.

My aim here is not to explain why São Paulo's water is not being rationed equitably. Instead, I use an analysis of the historic and contemporary underpinnings of the present crisis, of the state and SABESP's *de facto*, passive rationing, and of the reaction and alternative proposals from several civil society groups, to propose a new approach to ecological scarcity. To understand the rationed city—whether the rationing is transparent and equitable or opaque and unequal—I argue that we should revitalize, in a socio-ecological and crisis-sensitive form, Manuel Castells' concept of collective consumption politics: namely, contests over how states

¹ SABESP directly serves most, but not all, of the state's water consumers, including the city of São Paulo and most neighboring municipalities.

² Rationing of outdoor water use is more common worldwide, but is less intrusive than wholesale shut-offs.

provide, or facilitate, the goods and services that sustain urban living, with struggles over any one element implicating several others (Castells 1977, 1983, 2002).

More specifically, I argue that in São Paulo, the politics of water rationing doubly fuse with those of housing and land use—physically and politically. And more broadly, I contend that in large, segregated cities in a warming world, the politics of extreme weather are the politics of collective consumption. The question is how acute crises and longstanding socio-ecological struggles interact, from above and below.

Collective consumption and the rationed city

The most vibrant accounts of urban water politics come from the field of urban political ecology, for which water has served as a leading case of the co-constitution of nature, urbanization, and modernity (Gandy 2014; Heynen, Kaika, and Swyngedouw 2006; Kaika 2005; Keil 2005; Swyngedouw 2004). The field has paid increasing attention to urban regions of the global south, especially water's entwinement with a broad array of messy urban processes, where the problems of unequal housing and land use often play a central role (Amin 2014; Anand 2011; Bakker and Kooy 2010; Barnes 2014; Kane 2012; Meehan 2013; Rademacher 2011). A crucial dilemma, to which the field keeps returning, is how to place water struggles in relation to overlapping, *meso*-level politics in volatile moments.

For many, the answer lies outside the familiar domains of water governance and their institutions. Karen Bakker (2010) argues that the levers of socio-political power needed to democratize water governance will be found in “right to the city” struggles. Patrick Bond (2012) develops that idea, locating water struggles in a broader South African “right to the city” movement, showing how these are connected, and analogous to, other battles around the decommodification of basic necessities, like housing and anti-retroviral treatments for AIDS. Meanwhile, Eric Swyngedouw (2009: 228), expresses frustration that, most often, a “post-political environmental consensus ... forestalls the articulation of divergent, conflicting and alternative trajectories of future socio-environmental possibilities.”

The right to the city, or the genuinely “political”, serve as helpful categories for naming what broad coalitions fight for, or for distinguishing struggle from co-optation. But how should we characterize the viscera of a socio-ecological politics still in motion?

The issue with rationing is that in a city of “splintered infrastructure networks” (Graham and Marvin 2001), there can be no clean one-to-one relationship between a logic of distribution, infrastructural practices, physical topography, and the related patterns of land use and housing. There is no one button anyone can press to guarantee that each resident receives the same quantity of liquid. For physical and political reasons, the politics of water implicate both the substance of other issues and the rules of statue rule.

Here, a revitalized socio-ecological notion of collective consumption, made sensitive to political volatility, proves helpful. Castells (1977, 2002) first developed the concept to specify what he viewed as the distinctive function of the urban, namely the state-facilitated reproduction of labor—in other words, keeping workers alive and productive. This required goods and services, like housing and health care,

that it would be inefficient for the market to provide. (Or so it seemed in 1970s Paris.) As the Fordist state crumbled, Castells (1983) adopted a less structuralist position, reformulating collective consumption politics in conjoined material and cultural terms and taking the internal dynamics of movements more seriously. Collective consumption goods and services were still facilitated by the state, but now Castells viewed the quality and extent of the state's activities more as the result of social movement struggle than of the functional requirements of capital.³ Throughout, key threads of continuity are the emphasis on the state's role in facilitating these goods and services, and the emphasis on their unequal provision as the contested crux of urban inequality.

Parsing the debates spurred by the concept is beyond this article's scope. Instead, I redeploy it here to emphasize political struggle from below and above where water is but one of several, interconnected, state-facilitated socio-ecological goods and services whose caliber and distribution are crucial to the quality of urban life. Paying attention to political volatility, where prevailing schemas and resources can be reconfigured (Sewell Jr 2005), tightens our focus on the question of political contagion, which is pursued by social movements, and containment, which is typically pursued from above.⁴

Returning to São Paulo's water crisis, I argue that two of these classic collective consumption issues, housing and land use, possess priority. In unequal megacities like São Paulo, housing and land use are already key arenas for the accumulation of capital and for popular struggles to assert citizenship (Holston 2009, Roy 2009). Housing and land use are also central to a long-term sustainability and climate adaptation agenda. The construction of dense, affordable housing in well-served areas will be necessary for cities to lower their carbon emissions, a root cause of extreme weather (Cohen forthcoming; Seto et al 2014). And expanding affordable housing stock in well-served areas, and improving it in peripheral ones, would relieve pressure on urban areas' ecologically delicate edges—often favored sites for informal construction—while reducing people's vulnerability and facilitating the universalization of clean water and sanitation systems.

In May 2015, I conducted three weeks of interviews and participant observation in São Paulo, building on 12 prior months of fieldwork in the city on housing and ecological politics, and using a relational approach consistent with the collective consumption concept. Relational fieldwork “gives ontological primacy, not to groups or places, but to configurations of relations ... [and hence on] dynamics that emerge between groups or agencies qualitatively different from, yet oriented toward and enmeshed with, one another” (Desmond 2014: 554; see also Emirbayer 1997).

³ In São Paulo, social movement scholar Lúcio Kowarick has used Castells' concept and traced a similar path, from a narrower focus on housing movements' material interests to a closer engagement with their subjectivity (Kowarick 2000).

⁴ For a prior example in the context of ecological crisis, see Cohen and Liboiron 2014; Superstorm Research Lab 2013.

I have focused in particular on a range of actors seeking to transform the city's housing, transit, climate, and water politics. I have interviewed nearly 60 green policy elites, housing movement actors, and city planners and policymakers. I have attended their meetings and events, from rowdy housing protests and quiet gatherings in occupied buildings to city officials' public meetings about a new master plan to environmental seminars and green business networking events. And I have assembled and studied government documents, grey policy studies, and media reports.

The argument that follows reflects this cumulative research engagement, during which I have witnessed both mutual estrangement and, now, tentative cooperation, between the city's housing and environmental movements. I write in the midst of São Paulo's dry season. Water managers have averted a collapse in supplies, but the city's reservoirs sit emptier than one year ago. The advantage of informed, snapshot research in the midst of a crisis is that the moment's possible futures are viscerally present.

I begin my account of São Paulo's water crisis by briefly summarizing the historic entwinement of São Paulo's water, housing, and land use politics, then trace the more contemporary socio-ecological contours of the crisis. Then, I explore how the state and SABESP have pursued *de facto* rationing, while environmentalists and housing movements have advocated more sweeping and democratic programs of sharing scarce water.

Toward mutual estrangement

It was no accident that São Paulo became a "city of walls" (Caldeira 2000). The explosive growth of São Paulo's poor peripheries was first sparked by city elites' expelling the working class from a once compacted, mixed-income, street-car linked downtown, in an effort to homogenize central urban spaces (Holston 2008). Subsequent federal housing policies exacerbated the trend of sprawling peripheral development (Santoro, Ferrara, and Whately 2008), although the resulting areas were always socially varied; segregation has operated at a finer grain than the core-periphery opposition suggests (Caldeira 2000; Holston 2008).

The peripheries' expansion coincided with transformations of the city's river and road systems. 20th century governments paved over the city's countless rivers and streams to create a vast network of freeways to facilitate the movement of people and goods (Jacobi et al. 2015). The city's biggest rivers, Tietê and Pinheiros, and the larger of its two great southern reservoirs, Billings, were badly polluted by raw sewage and industrial waste. Neglect became norm. When Jacobi and Giorgetti (2009) surveyed residents of a peripheral, riverside neighborhood subject to flooding, more residents hoped that the adjacent stream would be paved over than the number who wanted it ecologically restored as a site for leisure.

Another crucial development was a 1977 environmental law that restricted legal land occupation along the edges of the southern zone's massive reservoirs and their watersheds. As land prices in the newly restricted areas collapsed, and a broader economic slow-down increased poverty, hundreds of thousands, perhaps a million, people moved into these and other precarious, waterside areas (Jacobi 2006; Santoro et al. 2008). Many of the resulting informal communities lack decent

infrastructure, are vulnerable to flash floods and mudslides, and dump sewage into waterways. Poor communities are not the only actors contributing to the degradation of the urban region's surface waters, but capturing and treating their sewage would help.⁵

There have been waves of contradictory policy efforts aimed at urbanizing or removing these communities, including a program to build "linear parks" along rivers. These have seen some success but moved slowly. Throughout, a core problem has been that those settled in vulnerable areas often resist efforts to displace them, even temporarily, usually because of residents' dissatisfaction with proposed resettlement offers or suspicion of formal authorities. As efforts to recuperate the city's waters have been pursued more vigorously by environmentalists since the 1990s, this dynamic has caused increasing tensions between two camps: on one hand, residents of these areas (typically termed "invaders"), housing movements, and allies in the city's Workers' Party; on the other, the city's environmental advocates and policymakers. Over and over, housing movement leaders have told me that these struggles alienated them from the city's environmental movement.

Political ecologists of São Paulo's water governance have grappled with these tensions. Prominent scholars have chronicled the segregated city's shifting historical relationship to local and regional waters (Abers and Keck 2013; Jacobi 2009; Jacobi et al. 2013; Jacobi, Fracalanza, and Silva-Sánchez 2015; Ribeiro 2011). But the authors' repeated calls for participatory processes rarely mention really existing housing movements. Yet those groups, in recent decades, have become the city's most consequential and vibrant activists (Earle 2010; Hirata and Oliveira 2012; Kowarick 1994). An excellent synthesis of the current water crisis never mentions the city's housing movements (Jacobi et al. 2015). Neither do Ana Paula Fracalanza et al (2013), even in their argument for a more egalitarian approach to water governance, which they frame in terms of environmental justice, but without reference to right the city concept, which is enshrined in Brazilian federal law, or the broad urban reform movement.⁶

It is true that most of the city's consolidated housing groups are focused on gaining access to vacant properties in the city center. But their urban reform agenda remains closely linked to the issue of ecological areas. The urbanist Maria Luisa Refinetti Martins (2011: 64), a rare housing scholar who engages ecological debates, argues that movements' housing agenda should be "observed as belonging to the same environmental perspective" as discussions of "urban expansion in environmentally fragile areas." The current Workers Party mayor's new master plan

⁵ In fact, while access to clean water is very high in São Paulo's formal neighborhoods, sanitation coverage is for various reasons much worse. It is likely that just over half of the city's sewage is treated.

⁶ To be sure, the city's more politicized housing movements have historically focused on the city center, with the exception of the Landless Workers' Housing Movement (MTST). Many other ad-hoc groups are widely accused of being led by opportunists hoping to profit from eventual resettlement incentives, and who mislead and coerce vulnerable followers desperate for somewhere to set up a shack.

for the city takes this basic approach. And its development has drawn cautious praise from environmentalists and housing activists. But it is a long way from being implemented.

In sum, clashing claims on the state, framed in terms of housing and economic justice on one hand and environmental terms on the other, have established a political culture that have pitted against each other two mobilized groups of advocates for more democratic, higher quality collective consumption. It is difficult to imagine a democratization of the urban region's water governance if these two camps cannot find some common ground. But as we shall see, the state and SABESP's actions during the current crisis are facilitating a tentative rapprochement.

Contours of the crisis

Rainfall levels in 2013 and 2014 were the lowest in the region's recorded history, as the governor and SABESP have repeatedly emphasized. But rainfall was nearly as low in 1953. Moreover, experts and government bodies have long warned that the city's water supply system was not keeping up with the region's growing population and consumption, and that it could "enter into collapse in the short term" (Ribeiro 2011: 130; see also Estado de São Paulo—Secretaria do Meio Ambiente 2009). Indeed, São Paulo's metro region is notoriously water-stressed, and so highly dependent on distant watersheds.

The governor and others have argued that the current drought was unforeseeable and have blamed its severity on anthropogenic climate change. But the best science expects global warming to increase rainfall (and flash floods) in São Paulo, not dry it out (Nobre 2010). There is, however, some evidence that human-driven climatic factors are aggravating the low rainfall—but these are regional, not planetary, and linked to Brazil's agro-industrial sectors.

In the University of São Paulo's Institute for Biosciences, I met the post-doctoral scholar Leandro Tambosi, whose research shows that some of São Paulo state's new vegetation is actually drying the Cantareira system. As the price of raising cattle rises, pasture land is being planted with eucalyptus to supply cellulose for making paper. But the eucalyptus trees suck great quantities of water out of the ground; when that water is evapotranspired into the air, prevailing winds blow it away. The news is not all bad. Scholars in the state's environmental ministry tell me that they will soon publish results showing that São Paulo state's reforestation—largely eucalyptus-driven—means that the region's forests, for the first time in years, are net absorbers of carbon.

Further afield, there is another story of the agro-ecological degradation of São Paulo's water supplies. The Amazon scholar Antonio Nobre (2014, pp. 17-18) released a high-profile, much discussed research synthesis in late 2014 that drew attention to the theory of flying rivers. The theory states that Amazonian trees evaporate massive amounts of water into enormous streams of vapor. These transport water high aboveground to south-eastern Brazil, where it falls as rain. This explains the relative humidity of the regions around Rio de Janeiro and São Paulo, while most of the globe, at that latitude, is desert dry.

But, Nobre has argued repeatedly in the Brazilian press, the Amazon's progressive deforestation, historically driven by the cattle and soya industries, is shrinking those flying rivers. The model implies one region is exporting the other's water—not piped directly into clear plastic bottles, but indirectly embedded in legumes and flesh. In both São Paulo state and further afield, the latest science suggests, land use decisions implicating booming export sectors are shaping the city's water supply.

Let us now turn to the narrower question of the water system's fortunes and management. Geraldo Alckmin is familiar with São Paulo's water stress. He was also governor in 2003, when water levels in the Cantareira system dropped below 5% of capacity, excluding the system's "dead volume". Reviewing press coverage from the era, I found several weeks when the implementation of rationing was thought to be days away, each time averted at the last minute by sudden rainfall. The following year, when SABESP renewed its contract for managing the region's water system, it agreed to a series of infrastructural projects to increase water supplies. Most were never started, but have reappeared during the current crisis as emergency measures to be rushed.

With this drought, rationing has returned to the headlines. By late 2013, it was clear that the state could be facing unprecedented crisis. But in 2014, Alckmin was running for re-election. The state and SABESP foreswore rationing, instead moving in February 2014 to reduce the water pressure in the pipes, announce a discount on water bills for those who cut consumption, link up several water systems to reduce dependence on Cantareira, and for the first time draw water from that system's "dead volume". The state government would also pursue a series of emergency infrastructural fixes to pull more water, both from the metro region and other watersheds, into the city's supply system. To pay for all this, SABESP has hiked water rates and cut its spending on its sewage system in half. It has emerged, however, that at the dawn of the crisis, SABESP's workers in fact planned to ration.

In an internal document prepared in January 2014, technicians lay out a detailed rationing plan that addressed both technical challenges and community outreach. It urged careful work to keep the population informed of looming water cuts, asserting that it was "vital that there be a week before the public announcement of a water rotation (*rodízio*) and its actual initiation," and detailing the need for daily and monthly informational updates on all aspects of the rationing and broader water situation (Relatório da Gestão MAGG 2014, pp. 14, 23-24). In the operational core of a public-private utility, bureaucrats had articulated a plan oriented toward community needs.

The plan was not implemented, and the Cantareira system bore the immediate brunt of the historic drought. Operated by SABESP, Cantareira has been the focus of analysis and media commentary for good reason: the system supplies nearly half of metro São Paulo's drinking water, including 9 million residential customers (Ribeiro 2011). The system is "a complex network of canals and pumping stations owned by the state and federal governments that diverted 31 cubic meters of water per second from tributaries of the Piracicaba River to provide water for the residents of São Paulo, less than 100 miles to the southeast" (Abers and Keck 2013:

146). At the time of writing, water withdrawals had been reduced by over 17 cubic meters per second, down from 31, in early 2014.

Even so, Cantareira's water is being drawn from "technical reserves", better known as its "dead volumes." These are three layers of water that until the current crisis had never been tapped; the water lies beneath dams' existing floodgates and is disproportionately polluted. Indeed, until 2014, the quantity of the "dead volume", which makes up nearly a fifth of the system's overall capacity, was not included in measures of available water supply.⁷

In mid-2014, SABESP resorted to Cantareira's dead volume with little publicity, spending tens of millions of dollars to deploy new pipes and floating water pumps to extract the water. In October 2014, Alckmin said on television, "There is no water shortage in São Paulo. There will be no water shortage in São Paulo." In fact, resorting to the Cantareira's dead volume as SABESP had done months earlier would expose and dry much of its ground soil, breaking the system's seal. It could take a decade to recover completely.

Were the timid water restraint measures of 2014 a mere question of political interference? Many critics do not think so, arguing persuasively that the utility's negligence was consistent with its status as a for-profit public-private utility. While the state owns a slender majority of the stocks, the rest have been listed on the São Paulo and New York exchanges since 2004. Federal and state public prosecutors have argued that, with support from the state government, SABESP prioritized easy profits over long-term investment and prudent management, even running up profits in 2012 and 2013 as the historic drought developed (Ministério Público Federal and Ministério Público do Estado de São Paulo 2014). Since SABESP's income depends on selling water, the allegation runs, it is biased against taking measures to reduce water consumption.

In truth, it is difficult to trace the width and path of each line of authority in the state's complex water governance system, which includes a wide range of actors and agencies. But it remains the case that SABESP is by far the largest and wealthiest of the water institutions, and that Alckmin directly or indirectly chooses the heads of the major water institutions. These are the two key actors in the crisis and this is why I focus on them. Moreover, SABESP has always implemented Alckmin's top priority in the crisis—to downplay its severity and to rule out rationing—even when utility leaders differed in opinion.

For instance, in late 2014, its leadership grew gravely concerned with public complacency, as revealed by a recording of a top-level meeting on October 20th, 2014, leaked to the *Folha de São Paulo*. One director describes the situation as "agonizing", saying he did not know what to do if the 2014-15 rainy season was as sparse as in 2013-2014. SABESP's president said, "I think that because of guidance

⁷ Critics, including the state's public ministry, have argued that SABESP is misleading the public and should report reserves on its website and in public releases as a *negative* percentage, to accurately reflect the unprecedented use of the dead volume and facilitate comparisons with historic water levels. SABESP has retorted that negative percentages are mathematically incoherent and that, in fact, water in the dead volume is of almost equal quality to normal reserves.

from above, SABESP has been in the media very little. I think it's a mistake. We needed to be in the media more ... all of us [utility leaders] on the same theme: conserve water. ... This needed to be reiterated in the media, but we had to follow guidance. We have superiors" (*Folha de São Paulo*, 10/24/2014). Whether this was a reference to Alckmin's office, or to SABESP's board of directors (the majority appointed by Alckmin), was unclear.

In sum, the water crisis has implicated a range of contentious political issues, from agro-industrial land use beyond city limits, to the actions of, and the relationship between, a governor's office and a profit-driven utility. In each case, Alckmin and SABESP have sought to contain the crisis by taking the minimum outward measures to curb water consumption or publicize the crisis. One result was the resort to Cantareira's "dead volume"; state and city depleted the urban region's most important supply system more than necessary. Still, reductions from Cantareira were nearly halved through 2014, and further cut in 2015. How?

Rationing the city

We must first note that the rationing debate in São Paulo turns on two words that are often, but not always, used interchangeably. *Rodízio* literally means rotation (like the alternation of water service on and off), but is often used in the more abstract sense of rationing. *Racionamento* means rationing in the English sense—namely, it refers to fixed allocations, and implies (but does not require) that these are equitable.

Nobody really contests the fact that SABESP's systematic reductions in water pressure, lasting several hours per day, lead taps to run dry (although governor has said that no one has "lacked for" water). Water will only flow from the faucet during off-hours if enough of it has been stored in a tank. Meanwhile, government entities and SABESP are pressing clients to reduce water use with financial incentives—bonuses for significant cutbacks since February 2014, and fines for using more water than in the previous year, since February 2015. But Alckmin has repeatedly argued that only switching neighbourhood taps on and off would constitute actual rationing.

SABESP's official plan for 2015 (released only in May), doubles down on the this argument in its opening pages, arguing that the utility has instead pursued only *voluntary* measures to curb consumption (the word "*racionamento*" nowhere appears in the report). The report frames the water pressure reductions not in terms of curbing consumption, but exclusively as a strategy to reduce leakage from pipes (through which a quarter to a third of the utility's water is lost). The report insists that rotation proper, in the sense of switching neighbourhood water mains on and off, must be avoided. First, because of this would be unduly coercive. And second, because in leaving leaky pipes empty for extended periods, these would be exposed the population to contamination, as soil and sewage could enter into depressurized pipes (SABESP 2015a: 13-14). Of course, reduced pressure also allows contaminants into pipes.

Fundamentally, the debate hinges on the issue of whether pressure reductions constitute a compulsory reduction of consumption, and if so, whose consumption is most forcibly reduced. The report strangely states that "it would be

imperious to emphasize that pressure reductions have been the most effective measure in confronting the water crisis, being responsible for reducing water drawn from the Cantareira system by only $7.3\text{m}^3/\text{s}$ (*Ibid.*: 20). But it is clear from the quantitative data presented pages later that pressure reduction *was* the measure responsible for the greatest reduction in the use of Cantareira water. Pressure reductions cut consumption by more than twice as much as voluntary reductions, the next most important measure, according to SABESP's own calculations (*Ibid.*: 24-5).

It may not shock readers to learn that the poor have suffered the most from these reductions, but discovering *how* is crucial to understanding the role of housing and land use.⁸ The clearest evidence for pressure reduction's unequal burden comes from polls by *Datafolha*. In October 2014 and February 2015 it asked respondents if they had experienced a disruption in water service. Each time it found that twice as many poor households as rich households reported dry taps, 65% to 32% in October, and 50% to 25% in February (*Datafolha* 2014: 36, 2015: 35).

Why the disjuncture? Poor neighborhoods and *favelas* are often furthest from transfer stations, and on highest ground. The poorest homes lack water tanks to store water if it does reach them, which means that their homes cannot accumulate water if and when it runs. SABESP has argued since January that even half-day reductions in water pressure would "not be noticed" by anyone living in a building with sufficiently large water tanks, pointing out (somewhat passive-aggressively) that "The National Institute of Technical Norms dictates that the client should possess water storage capacity to last a minimum of 24 hours" (SABESP 2015b). The October 2014 *Datafolha* poll found that house-dwellers were nearly three times as likely as apartment-dwellers to go without water.

In recognition of this issue, the state government, in January 2015, announced that it would distribute 25,000 water tanks to homes in the periphery by June; in early May, only 20% had been delivered (*Folha de São Paulo*, 5/9/2015). There is also the question of elevation. In February, SABESP's president conceded in testimony before São Paulo's city council that the utility was not, despite earlier promises, maintaining water pressure at the threshold required by the National Institute of Technical Norms to ensure that water would reach elevated areas (*G1*, 2/25/2015). Indeed, journalists have found several poor, peripheral neighborhoods where no water has run for days at a time.

In brief, when the total water supply is zero-sum and declining, tanks are a technology of systematically unequal distribution, not just individual convenience. Topography plays a supporting role. If the poor are getting less, that leaves more water for the rest. And vice versa.

Meanwhile, there are reports that, in fact, SABESP technicians *are* switching taps for whole neighborhoods on and off. Journalists with the *IG* group secretly recorded utility workers saying that they do exactly this every day (and are thus not merely reducing pressure); a high-level SABESP source told the *Estado de São Paulo*

⁸ The report never addresses the issue of the potential inequality of water provision.

newspaper that up to 40% of the metro region's neighborhoods were daily having their water toggled on and off (*JG São Paulo*, 2/6/1025; *Estado de São Paulo*, 2/7/2015). Such reports are impossible to verify, but easy to believe for those who track the city's politics.

A lawsuit filed against the state's water management by São Paulo's municipal Workers' Party calls the water pressure reductions "an undeclared rotation (*rodízio*), as various neighborhoods in the city's periphery report that for nearly a year they have gone without water for days" (Cardoso and Fiorilo: 20). When I raised the issue of rationing to a member of the Homeless Workers' Movement (MTST) who lives in the city's southern zone, she replied, "Maybe there's no rotation [*rodízio*] for the governor, but here there's rotation every day." She said that her neighborhood had gone up to five full days without water, making it impossible to send her child to school (which also sometimes closed when its taps ran dry), and that the situation caused delays in getting medical care. During other long stretches, she said, water only flowed from after midnight to the late morning. The woman's companions also spoke of water running dark and smelly, and causing weeklong spells of diarrhea. Epidemiologists have found that a spike in dysentery in 2014 was associated with water pressure reductions (*El País Brasil*, 7/16/2015).

Finally, I note the existence, widely denounced by many in civil society, of contracts with SABESP that charge companies a discounted water fee, reducing clients' economic incentive to save water. 537 such contracts were obtained and analyzed by independent media groups, *Pública* and *Artigo 19*, in May 2015. Until 2014, the contracts stipulated a minimum level of water consumption that companies had to pay for, and they forbade investment in alternative sources or water recycling. In 2014, SABESP struck these two conditions, but still signed 36 new fixed price contracts. Clients included banks, auto companies, sport clubs, and supermarkets (*Pública* 5/22/2015).

In May, the utility and government returned to arguing that if emergency works to add water to the reservoir system are not completed, and there is a profound emergency, there would need to be a rotation of five days without water, two days with water. SABESP held a seminar with regional army commanders, where the director of SABESP warned of total social breakdown as early as July unless emergency works to add water to the utility's supply system is completed, saying: "There will be terror. There will be no food, no electricity... Like a scene from the end of the world... But I hope that will not happen" (Rodrigues 2015). Two weeks later, an army division war-gamed the takeover of a SABESP building in a leafy, central neighborhood.

The positive case for transparent, equitable rationing is that it amounts to a difficult but ultimately open, democratic, and fair method of distributing scarce resources (Cox 2013). By late May 2015, the state government and SABESP had reframed rationing as a proto-apocalyptic last resort, the final gasp of a collapsing water system with the army looming behind dry taps. What is occluded by the this harsh rhetoric is the notion that rationing need not be achieved by pipes and taps alone, but could instead be realized through a combination of top-down, state-led action and grassroots governance from below. In other words, one could agree with SABESP's view that large-scale rotation is impractical, but still support egalitarian

rationing. But if this vision of collective consumption were to be implemented for water, why should it end there? And what would this imply for the rules of state rule?

Beyond rationing

Below, I show that in the self-conscious politics of housing and environmental movement organizers, the relationship of housing and land use to water is front of mind. But demands for more democratic water governance also draw on, and spill into, other domains of collective consumption struggle.

The “June Days” of 2013 are a crucial precedent to the present crisis. In late June of that year, hundreds of thousands took to the streets of São Paulo and other major cities to protest a 20-cent hike to the bus fare (Carta Maior ed. 2013). They were the largest demonstrations in two decades. Fare hikes were repealed across the country. Protestors represented Brazil’s full class and race spectrum, fostering unexpected encounters and alliances. And there was a kind of issue contagion from the 20-cent transit fare hike to a gamut of collective consumption concerns. Complaints quickly encompassed health and education services, government corruption, and wasted spending on the World Cup. Less obvious in the moment was that this brief eruption lingered and expanded in São Paulo’s peripheries, where housing anchored a range of “right to the city” demands.⁹

In December of 2013, as I sat in on a meeting of the MTST in a movement occupation that they called the Gaza Strip, an organizer told me, “We’re harvesting the fruits of June.” Also in December, the city government’s district administrator of a peripheral neighborhood in the city’s southern zone would tell me, albeit less enthusiastically, that the number of vacant land occupations by housing movements in her district had exploded.

⁹ Indeed, the housing movement’s political partner, the Active Periphery group, was already making this argument in its newsletter in June and July of 2013. See www.periferiaativa.org.



Figure 1: Jussara Basso of the MTST in the New Palestine Encampment in São Paulo's southwestern zone. Photograph by the author.

In May 2015, in the MTST encampment called New Palestine at the city's south-western edge (see fig. 1), the organizer Jussara Basso argued that nearly two years after the June Days, the MTST was still growing thanks to its aftermath. Basso said that while canceling the bus fare hike stemmed the downtown protests, it also showed workers in the periphery that political action had immediate effects. "By the end of 2013," she said, "there were 54 housing occupations just in São Paulo, many of them spontaneous." Housing occupations—not bus protests. With the MTST seizing leadership of the new energy in the housing movement, its most visible leader, Guilherme Boulos, was offered a column in the mainstream *Folha de São Paulo* newspaper. The most boisterous protest against the state's handling of the water crisis was led by the MTST, drawing at 15,000 people into downtown streets in February 2015.

I note the June Days' precedent because as the state and SABESP focus primarily on water infrastructure, and the mainstream media provides only intermittent coverage of the crisis, the visible, public politics of São Paulo's water shortage have largely been driven by sectors of civil society (broadly conceived) experimenting with cooperation and alliance—especially the housing movements mobilizing the poor and the environmental groups with an audience in the city's middle class. The broad-based, unruly, unpredictable social eruption of June 2013 threatens to reappear here, extending the egalitarian logic of rationing water into broader demands.

I met a leading member of the environmental movement in one of the city's first community gardens in Pinheiros, a wealthy neighbourhood a world away from New Palestine. Claudia Visoni, an activist with the Alliance for Water, told me that "São Paulo is the most humid desert in the world." Drinking water is largely drawn from the city's hinterlands, ignoring long-polluted sources closer to home. As I help Visoni haul sap-sticky wood from her station wagon's trunk to the garden to fortify a bridge over a wrinkle in the ground, she tells me how her fellow gardeners found a tiny water source, just beneath the ground surface. They dug out around it and are now using it to irrigate fruits, vegetables, and flowers. The city is full of such small springs, but environmental activists have only recently taken an interest. One group is called *Ruas e Ríos*, roads and rivers, which produced a widely viewed online video reminding residents that almost every major avenue was paved over a river just decades ago.

In fact, both environmentalists and housing movement leaders have called for the state government to help community groups test, store, and find uses for spring- and well-water. And they blame SABESP's business model—selling water as a product—for the state's and the utility's reluctance to help people get water elsewhere, actions that would empower citizens and break SABESP's monopoly on the provision of water. The focus on taking better care of local sources resonates with a desire, increasingly widespread across civil society, for government to go further in peeling back the city's ubiquitous concrete and planting more vegetation. This would help stave off heat waves and flash floods, each projected to worsen with global warming. The architect Milton Braga has even called for a massive campaign to build roof-top and sidewalk gardens as a system of "micro-drainage". "Think about a salad spinner," he told me. "You see how much water comes out when you dry the leaves?"

In its more elaborate form, the alternative paradigm with broad support from environmentalists is to reduce dependence on distant water sources and instead focus on reducing consumption and on retaining rain- and storm-water, treating all of the city's sewage, cleaning the water in city's rivers and reservoirs, and expanding and revitalizing local watersheds. What's clear enough to drink, drink; what's not, use for anything else.

This alternative paradigm resonates with urban projects around the world that are seeking to "climate proof" their water supplies by ramping up sewage recycling, building desalination plants, or dramatically reducing unnecessary (frequently outdoor) water use. But these are typically the projects of prosperous cities, which have the luxury of taking already decent, and universal, drinking and sewage networks for granted. São Paulo, like other southern metropolises, faces a more encompassing set of challenges related to its patterns of housing and land use. A succession of the city's municipal governments, although not directly responsible for providing clean water or sewage, have facilitated coordinated housing and sanitation plans that, in theory, project the urbanization of all the city's favelas, and the universalization of the sanitation system, by 2025. But the plans are languishing behind schedule and are underfunded, in need of more federal support.

None of this rules out an immediate, if slow and low-tech, shift to the alternative paradigm. Part of the problem, Marussia Whately, of the Alliance for

Water, argues, is that the government's emergency measures are entrenching an already broken model: seeking water from further away (especially the already-stressed Paraíba do Sul river), ignoring untreated water close by, slashing investment in sewage treatment, and refusing to lead sustained and attractive campaign for water conservation. Green groups are pushing back, though with limited resources. Visoni is active with, Cisterns Now!, an organization which has been running workshops to teach residents how to make cheap cisterns with plastic barrels and PVC tubing, to capture and safely store rainwater for watering plants and washing homes, vehicles, and sidewalks. The group is building a diverse constituency.

In São Mateus, a poor neighborhood in the city's peripheral eastern reaches, I visited Terezinha Silva, a long-standing housing movement activist with the Movement to Defend the Favelado, the organizer of a cooperative of woman cooks and artisans, and now a key figure the "Urban Program", an initiative of two housing movements, the British Catholic charity CAFOD, and European development funding. The program aims to integrate sustainability and housing politics. Silva had learned to make cisterns thanks to the Cisterns Now! And she won mainstream media attention for building and brightly painting her own, then leading dozens of workshops in the favelas of her neighborhood where she helped others in the housing movement to build theirs. In her own backyard, Silva uses a network of three cisterns, one with the slogan "responsible consumption" painted on it, to store rainwater to use in her garden. The cisterns cut her water bills by two-thirds, she told me, even as rates have increased. But when I asked her if the system allowed her to escape, in part, from the water crisis, she bristled. "The state is politically responsible for providing water," she insisted.

But this was a message she would have to repeat. *A/7*, an online branch of Al Jazeera that films short videos, had also found Silva and produced a 70 second video of Silva talking about her cistern work in her garden with English subtitles. The American site Upworthy then picked it up. On Facebook alone, the video had amassed over 650,000 views. Silva shared the link—but strained to articulate her basic message. Unusually writing in ALL CAPS, she pointed out: "We each have to do our part! And not let the state off the hook for fulfilling its duties, the water crisis is not the people's fault. It's the state's fault." In fact, the vision that Silva's housing movement has pressed is neither self-help nor state-reliance, but a more challenging campaign that links greater grassroots autonomy to increased state accountability (on this vision of democracy, see Baiocchi et al 2011). In this vein, the movements affiliated with the Urban Program have occupied vacant buildings and terrains to highlight the state's responsibility, enshrined in law, to promote the "social function" of property. This campaign has merged social, economic, and environmental demands for a decent quality of life, and pursued these with confrontational vigor.



Figure 2: A housing project built near São Mateus neighborhood after years of advocacy from the Movement to Defend the Favelado. Photography by the author.

Back in São Mateus, other housing activists were emphatic about the historic entwinement of multiple collective consumption demands. In a cramped, dark garage, Silva helped another family build its own cistern, while a longtime housing organizer told me of the thirty years it had taken her neighborhood movement to get the city government—with federal financial help—to pave the roads in their informal community, regularize their land titles, and build new, safer housing to protect inhabitants from floods (see Figure 2). The cisterns would help. But it had taken decades just to get a decent connection to SABESP’s network of pipes. Their latest triumph was a local daycare center. For these activists, there was a sharper division between government neglect and mobilized democracy than between decent housing, supported by public services, and a SABESP utility bill. This is a politics of collective consumption, where symbols and services, social and ecological goods are knotted together and anchored by housing.

The MTST housing organizer Jussara Basso made this argument to me even more directly at the New Palestine encampment. “The issue with raising the housing banner,” Basso said, “is that housing is the foundation. If you don’t have an address you can’t get work, you can’t get your child into a day care, you can’t get into a school, you can’t get public health care, you need to show proof of residence to be hired by a company. ... It’s the foundation of human dignity.” But not just any housing, even if subsidized by the state. Here, she echoed a broad housing movement discourse, saying, “Normal construction companies [that receive state subsidies] will buy the cheapest land, with the least public transit, the fewest

schools, to make apartments with the worst materials they can find,” using public subsidies. When the MTST secured federal housing for its members via its strategy of occupations, she said, “We have the vision of dignity, quality of life, which is a right.”

Basso added that she had been surprised at the potential for new alliance building during the drought. “Some dumb environmentalists still blame us for polluting the water by occupying places like this [near waterways],” she said. She would not name individuals, but said that a number of environmentalists had approached the MTST to discuss cooperation. And she said the MTST was demanding, among other things, that the state support community efforts at using rainwater and local sources by distributing filters and other water capture and treatment tools, echoing the demands raised by conventional environmentalist groups like the Alliance for Water and its allies. Indeed, in August 2015, activists from Cisterns Now! visited New Palestine and pledged to help install cisterns to capture rainwater for the occupation’s gardens and for cleaning its kitchens.

The MTST’s demands echoed the vision of responsible, equitable rationing laid out by Marzeni Pereira, a SABESP technician and respected authority on the current crisis, who was fired for challenging utility policies. After a meeting of the “Water Yes, Profits No” collective that he helped to organize, Pereira presented a rare, comprehensive defense of water rationing. “Better than a water rotation (*rodízio*) in my point of view is rationing (*acionamento*),” he said. “Rationing means that you guarantee supply for every person, that every person has a minimal quota. ... It’s better than a rotation, because with a rotation, if you don’t have a water tank, or you have a small water tank and a big family, you go without water.” I asked about the problems with SABESP’s infrastructure.

Pereira said that in every home, there was a water meter that could establish how much each household received. “Second, you can send water in trucks, and open wells and treat the water, for areas [SABESP’s] network doesn’t reach. You do a program to collect and use rainwater, with government support to guarantee that the water is minimally treated for uses besides drinking.” Rationing, he continued, was a social and collective solution. “Rationing requires a big awareness program, the involvement of neighbors, the community. It gives a whole other vision. Similarly—”and here he paused. “We defend—it doesn’t make sense for one person to have four cars, while another takes the bus. It’s necessary to ration resources.” Soon, he was talking about solar panels and quantifying the export of water, embodied in agricultural goods, from the Amazon region, and citing the theory of the Amazon’s flying rivers.

Overall, the comments presented a holistic vision of rationing that resembled Silva’s and her housing group’s. It combined state resources, community-oriented technicians, and grassroots groups, emphasizing the joint role of a more accountable state and confrontational social movements. But it was precisely this joining impulse, and its underpinning analysis, that make the vision threatening. If water, why not cars? If a public utility, why not a fully democratic one?

How else would a broad coalition operate? I attended the second meeting of the State Assembly of Water, a day-long event that manifested some the June 2013 eruption’s other key qualities—a multi-racial, multi-class assemblage and strong

representation from the city's peripheries. By day's end, agreed demands included calls for SABESP to be re-nationalized, and then subjected to "democratic control." But the masses were missing. In the building of the metro workers' union, whose central area was a colorful indoor soccer pitch-cum-amphitheater, the number of participants peaked near 130. The contrast between the breadth of speakers—drawn from several housing movements, community groups, unions, socialist parties, and middle-class environmental groups—and the overall size of the gathering struck me as ominous. Political contagion requires not just-networking at the level of groups' leaders, but also existing and expanding memberships.¹⁰

In everyday life and in the media, as I experienced them in May 2015, the water crisis was a nuisance and a source of anxiety, but it had lost the sting of an acute, imminent crisis. Or perhaps more importantly, the governor Alckmin's political vulnerability has been moderated by the even deeper crisis facing his natural rival, the Workers' Party, in São Paulo and throughout Brazil. In the summer of 2015, President Dilma Rousseff polled below 10% support as she bore the brunt of the country's most damaging corruption crisis in decades, which is coinciding with a painful recession. Crises are fickle. At present, it is impossible to predict what will happen to the city's water supplies—whether emergency water works will be completed, whether rains will return to more normal levels, or how federal politics will influence those of the state and urban region. The mobilizing capacity of the emerging civil society alliances will depend on all those factors. Paradoxically, both Alckmin's efforts to contain the water crisis, and a range of social movements' efforts to explode it, may both succeed for some time.

Between unequal and democratic ecologies

In the wake of the June 2013 protests, with their rapid spread of discontent from a 20-cent bus ticket increase to health and education and corruption, the prospect of a broad, angry alliance anchored in water and housing protest, remains a real possibility. As the MTST's Basso put it to me: "Everyone is asking themselves now, what's the new 20 cents going to be?" Meanwhile, the leftist activists of the "Water Yes, Profits No" collective search for a way to make water into what they term an "intersectional" issue, binding a whole series of struggles together. But if the city's water supplies hold until the rainy season, and rains fall at typical levels, the moment will pass. Ecological suffering will again be governed by the pace of "slow violence", unspectacular environmental injustice that is so difficult to combat (Auyero and Swistun 2009; Nixon 2011).

I want to conclude here, then, in the midst of crisis, by seeking to clarify how two projects to shift the city's politics of collective consumption express two of this event's emergent logics (Sewell Jr 2005): one reinforcing unequal ecologies, one in pursuit of democratic ecologies; the first seeking to contain the crisis, the second to explode it.

¹⁰ But note, a lead organizer of the Free Fare movement that sparked the June Days told me in 2013 that weeks before that explosion of those protests, only 40 people attended organizing meetings.

For governing elites, the path of least resistance is to preserve the status quo. Adjust the pressure to keep the present regime of collective consumption going, however fitfully. Muddling along with patch-ups, while leaving untouched most of the privileges of the elite and the middle class means reinforcing unequal ecologies, while trying to downplay the suffering of the poor. In São Paulo, this drift has resulted from the state and its water utility doubling down on existing lines of authority, and implementing opaque, unequal, and *de facto* rationing through water pressure reductions. If water shortages continue, or emergency works are again delayed, the costs of this approach will rise. For the already prosperous liable to choose or support this path, it looks less like an endorsement of a long-term strategy for confronting concatenating ecological crises than a perpetual preference for what, step by step, feels closest to the familiar present, while containing unpredictable political contagion among social movements. Unequal ecologies result from elites'—and their supporters'—political loss aversion.

The alternative path is one of democratic ecologies, where goods accepted as essential are furnished and distributed by the state and its community partners with a non-market logic, with leadership and autonomy from below, alliance with experts, and the financial support of public institutions. But such a program is constitutively vague (see Backer 2010). How can a newly democratic arrangement be coherently specified in advance? Where would the line be drawn between basic services beyond the pale of the market and other consumption goods? If access to water is guaranteed, why not housing? If housing, why not secondary education, why not top universities? Why not a basic minimum income? And what exactly would the novel institutional configurations that share power look like? These questions, of course, presume success. More modest questions might be asked of a situation like São Paulo's, where democratic ecologies are more likely to be a lasting project pursued at the margins than an immediate achievement. How can environmentalists and housing movements, so long at odds, keep cooperating once the shock of crisis fades? How might popular movements work to expand contacts with sympathetic professional class experts, who recognize the issues, but whose everyday life occurs in other social realms?

If the perpetuation of unequal ecologies defers political uncertainty, the pursuit of democratic ecologies begins with them.

For most of the world, the era of cheap and plentiful drinking water has passed. For water, and likely other resources besides, the 21st century city will be rationed. The question is how. Compared to rationing medicine, which entails the refusal of potentially life-saving treatment to certain patients (Scheunemann and White 2011), sharing water fairly and transparently would seem to be simple and obvious. But in socio-spatially segregated urban regions, whose politics of land use and housing are fused with water infrastructures, and whose dynamics structure core economic and political logics, the question of water is a question of power (Swyngedouw 2004). In the rationed city, sharing the first requires sharing the second.

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