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SciELO

Water injustice in times of scarcity: an analysis of the case of the city of São Paulo

Vanessa Victor da Cruz de Souza [I]
Ana Paula Fracalanza [II]
Pedro Luiz Côrtes [III]

Abstract: In times of water crisis, equitable water management is essential to guarantee access to all population groups. The water crisis experienced in the Metropolitan Region of São Paulo between 2014 and 2016 revealed, in addition to conflicts over the use of this resource, the risks that socio-environmentally vulnerable populations are exposed to when there is a period of drought. This study aimed to verify whether the water management process in the city of São Paulo resulted in situations of water injustice during the period of water supply crisis. This is a case study with statistical analysis of data collected through questionnaires. The data were processed using the IBM SPSS® software, and the results were presented in graphs. Analysis of the graphs allowed us to understand the impact on the users of the crisis management carried out by Sabesp.

Keywords: Water Injustice; socio-environmental vulnerability; right to water; water supply; Metropolitan Region of São Paulo.

[I] *Universidade Estadual de São Paulo (USP), São Paulo, São Paulo, Brasil*

[II] *Universidade Estadual de São Paulo (USP), São Paulo, São Paulo, Brasil*

[III] *Universidade Estadual de São Paulo (USP), São Paulo, São Paulo, Brasil*

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Introduction

Water is a vital common resource, scarce in many regions of the planet and essential to the balance of ecosystems, quality of life, socioeconomic development, and poverty eradication. However, such importance of water to sustaining life does not ensure equity in its distribution. Thus, individuals in situations of greater socio-environmental vulnerability often have reduced access to this resource, both in quantity and quality.

Populations with high socio-environmental vulnerability demonstrate a lower capacity to advocate for their rights, and as a result, decision-makers tend to favor access to water supply for populations with lower socio-environmental vulnerability and higher incomes (Acselrad *et al.,* 2009). During periods of scarcity, access to water for socioeconomically distinct populations occurs unequally, both in quantity and quality (Swyngedouw; Boelens, 2018).

This scenario places the state, decision-makers, and society before emerging issues, such as the impact of water on health, population well-being, and the natural environment, besides highlighting the need for sustainable management of water resources to ensure water security. This is especially true in areas most affected by droughts and densely populated regions, where equitable and qualitative water supply to the population must be prioritized (Dolnicar; Schäfer, 2009).

The portion of the population occupying particularly higher-end urban areas tends to have greater water security than others. According to López et al. (2019), prioritizing the rights of higher-income populations to obtain water in such circumstances becomes a matter of political power. The São Paulo Metropolitan Region (RMSP) faced a water crisis due to a lack of rainfall from late 2014 to 2016. According to Côrtes (2015), this water crisis was triggered by a lack of planning and strategic management, which affected the metropolis' water supply system.

To address the crisis, the São Paulo State Basic Sanitation Company (Sabesp) initiated a set of measures in 2014 called 'Contingency Actions for Flow Reduction,' which included: i. contingency actions for flow reduction, ii. customer consumption management (Bonus Program), iii. transferring treated water from other production systems, iv. intensifying the loss reduction program, installing and optimizing PRVs (Pressure Reducing Valves), v. utilizing technical reserves, and vi. institutional actions (Sabesp, 2015).

With the drought and supply crisis that hit the RMSP from 2014 to 2016, issues surrounding public water supply and availability became recurring central topics in major print and television news outlets (Martirani; Peres, 2016). This study aimed to analyze whether the water management process in the municipality of São Paulo resulted in situations of water injustice during the water supply crisis from 2014 to 2016.

Methodology

The research method used for the development of this study was the Case Study, supported by bibliographic research. For data triangulation, three sources of evidence were collected: primary data obtained through questionnaires, journalistic survey, and

two sampling surveys.

The journalistic survey was conducted using the digital archives of the following newspapers: *O Estado de São Paulo* (*Estadão*), *Folha de São Paulo*, and *Agora São Paulo*. These newspapers offer free digital access to their print editions. The research focused on articles that pointed to the alleged inequality in access to water and enabled

the analysis of water injustice during the crisis period. To filter the articles, the research was limited to the period from 2014 to 2016 and specific keyword groups.

The keyword groups used for the journalistic research and the respective number of articles found were: i. "lack of water, São Paulo" (17), ii. "no water, São Paulo" (8), iii. "neighborhoods water rationing " (10), iv. " Sabesp rotation" (6), totaling 41 articles. In addition to the journalistic survey, an article on the subject published in Exame magazine in 2014 was considered for this research. The search used the following keywords: "poor people; rich people; no water; São Paulo".

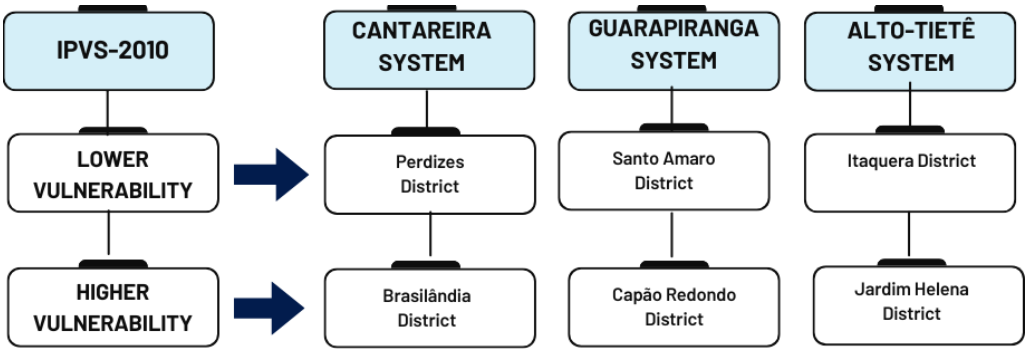
Regarding the sampling surveys, two surveys conducted by the Datafolha Institute were analyzed: "Water Crisis in São Paulo," dated from October 29, 2015, and "São Paulo Thermometer: Water Crisis in São Paulo," dated from October 17, 2014. Both surveys were carried out by the Opinion Research Management of the Datafolha Institute. These are stratified sampling surveys based on gender and age, with random selection of respondents. The universe of these surveys consists of voters aged 16 and over residing in the city of São Paulo (Datafolha, 2015; 2014).

Finally, the collection and analysis of primary data (questionnaires) were conducted. To this end, the São Paulo Social Vulnerability Index (IPVS) was used to characterize socio-environmental vulnerability and define the study areas. This index was developed by the State Data Analysis System Foundation - Seade and presents vulnerability groups across all districts of São Paulo. The index is based on two fundamental assumptions: the first is the multiple dimensions of poverty to characterize social vulnerability, and the second is that São Paulo's urban spaces are marked by social segregation (Seade, 2013).

The selection of the districts where primary data collection was carried out through questionnaire application resulted from the combined analysis of the IPVS and the coverage areas of each water supply system within the municipality of São Paulo.

For the application of the questionnaires, three water supply systems were selected, with two districts chosen for each system: one district with higher vulnerability and another with lower vulnerability, according to the IPVS-2010. Among those supplied by the Cantareira System, the districts of Perdizes and Brasilândia were chosen; for the Alto Tietê System, the districts of Itaquera and Jardim Helena. Finally, for the Guarapiranga System, the districts of Santo Amaro and Capão Redondo were selected. Fifty questionnaires were administered in each of the selected areas, totaling 300 questionnaires, as shown in Figure 1's diagram.

Figure 1: Districts analyzed by water supply system



Source: Designed by the authors, 2023.

Data collection was conducted between 09/01/2022 and 10/22/2022, using printed questionnaires manually completed by respondents. The questionnaires contained 26 questions distributed across different thematic categories, addressing aspects such as the frequency and duration of water supply interruptions, strategies adopted for water conservation and storage, as well as perceptions of the quality of water supplied to households. The questions were structured in a multiple-choice format, allowing respondents to select either a single alternative or a specific number of options, as specified.

Quantitative data were processed using the IBM SPSS® software to perform a descriptive statistical analysis, the results of which were presented in graphs. The statistical parameters addressed included socioeconomic profile, water storage capacity, the frequency and duration of water supply interruptions, besides perceptions of water quality.

Socio-environmental vulnerability and access to water

The concept of vulnerability originates in the legal field, specifically from the Universal Rights of Man and bioethical issues. Consequently, vulnerability refers to individuals or groups of individuals who are politically or legally weakened in terms of the protection, promotion, or guarantee of their citizenship rights (Alves, 1994).

Different interpretations of the concept of vulnerability are used across various fields of knowledge, such as law, development and sustainability, poverty and food security, macroeconomics, natural and technological disasters, global climate change, and public health issues, among others (Alves, 2013; Porto, 2011; Luers, 2005). According to Porto (2011), the polysemic nature of the concept of vulnerability is due to the complexity of the issues it addresses.

Socio-environmental vulnerability measures both the population's sensitivity to natural disasters and its capacity to respond to and recover from the damages caused by these disasters (Adger, 2006). Environmental risks pose serious threats to human survival and livelihoods as they can lead to loss of crops, food insecurity, water shortages, destruction of homes, and the loss of a sense of place (Das *et al.*, 2021). Societies do not distribute

environmental risks equally and, at times, make poorer communities the weakest links in their capacity to mitigate and respond to these risks (Cutter *et al.,* 2012).

Mohai (2007) points out that understanding the causes of environmental inequality requires analyzing the roles of race and social class, as disparities have been identified in both dimensions throughout studies on the distribution of environmental risks. Since water is a vital resource, addressing issues related to inequality in its management is essential to ensuring secure access to this resource.

Thus, population groups composed of traditional peoples, the poor, Black communities, peasants, women, fishermen, and excluded workers, as well as territories in Latin America, Africa, and Asia, are those most affected by the economic production model based on the exploitation of both labor and ecosystems (Porto, 2007). The adoption of effective equality and equity policies is an alternative to uphold humanity's most cherished values and improve life for all in society, despite the barriers imposed by capitalism (Azevedo, 2013).

In the early years of the 21st century, there has been a global intensification in the relentless pursuit of greater efficiency in the use of natural resources, especially water, which has led to changes in patterns and paradigms for water resource management in various parts of the world, particularly in areas where socio-environmental vulnerability compromises access to water (Pouladi *et al.,* 2019; Lu *et al*., 2018; Bos, 2017; Bulto, 2015).

Cutter and Finch (2008) assert that race/ethnicity, socioeconomic class, age, and gender are among the most common characteristics defining vulnerable populations. The issue of water access in large urban centers of developing countries goes beyond water itself, as the time spent attempting to obtain it limits other opportunities, such as income generation or access to education (Brisman; South, 2016). Historically vulnerable populations tend to remain in this position because they are often overlooked by decision-makers in ensuring access to their rights.

Although water is a common good and a vital resource, managers and decision-makers have opted for a water management that prioritizes certain groups of people and sectors of society over others. Thus, creating a scenario of water injustice, especially during crises. This reproduces inequalities that can also be observed in the socioeconomic sphere (Bischoff-Mattson *et al.,* 2020).

The space occupied by socio-environmentally vulnerable populations ends up being overlooked in the water management process during times of crisis. This context has the potential to generate conflicts over water. Water conflicts involve consumers of this resource, who use it for carrying out their natural and social activities, as well as groups interested in their own survival and that of other living beings, and managers (Fracalanza; Freire, 2015). Competition for water during times of scarcity gives rise to conflicts or intensifies existing ones, increasing the complexity of water governance (López *et al*., 2019).

People without legal access to water are more vulnerable, spending considerable time accessing water and sanitation facilities. This may mean missing work, walking long distances to fetch water, and even buying it from illegal and informal sources (Brisman; South, 2016). From this perspective, the lack of water becomes a tool to reinforce poverty

and exclusion, perpetuating socio-environmental vulnerability.

The absence of the right to access water in the production of water injustice

When, regardless of the origin of water scarcity, inequality in access leaves some populations under extreme water stress, human rights to water, food, and life are violated (Carr *et al.,* 2015). The use and occupation of space are often determined by the ease of appropriating and using natural resources, especially water. According to the Hague Declaration, access to water is vital for a country to achieve socioeconomic development (Haia, 2000).

The increasing demand for water in large urban centers is restricting this right for a portion of the population, particularly low-income groups. During periods of scarcity, it is crucial to treat populations equitably in terms of water distribution so that no segment of society is disadvantaged in terms of supply (Fracalanza; Freire, 2015).

In situations of low availability, competition for water becomes more intense, and rationing itself is a challenge. It is necessary to prioritize water use, as various sectors compete for it, such as industry, agriculture, and population supply; the rights of nature and the ecological cycles dependent on water resources should also be considered (Gómez-Limón *et al.,* 2020).

Water-related rights are characterized by sociomaterial and political-cultural relations and by dynamics of inclusion and exclusion in access to this resource (López *et al*., 2019). Therefore, it is the public authorities' duty to ensure funding to effectively guarantee the right to access water for all and to promote sustainable use (Petrella, 2002).

It is worth noting that water availability does not guarantee the right to access or to services derived from it; for example, regions such as the Amazon area, southern Mexico, and the banks of large Latin American rivers face supply crises that compromise the quantity, quality, or both, of water available to the population (Bulto, 2015).

Even though Brazil is the largest natural reservoir of fresh water globally, severe social problems related to water can be observed across various parts of the national territory, ranging from absolute scarcity to outright waste, as well as issues of poor quality due to organic and chemical contamination (Augusto *et al*., 2012).

Water is an essential resource for life, yet the right to human access to it is still striving for a status equivalent to that of explicitly recognized socioeconomic rights, thus, there is no legislation that specifically addresses the various issues surrounding the right to water. In many countries, still including Brazil, the right to water is derived from other rights that are more explicitly protected (Bulto, 2015).

Although there are numerous regulations and laws, including in Brazil, addressing the right to human access to this resource, a lack of specificity in these documents remains evident. Issues such as prior appropriation or historical water rights of traditional populations, like riverside and Indigenous communities, the right of nature to water, and the diversity of groups in distinct socioeconomic situations are insufficiently addressed (López *et al.,* 2019).

Compliance with the law or sets of norms does not necessarily equate to justice. This is because, in many cases, conflicting situations may remain unresolved (Sen, 2011). Observing the inequality in access to potable water experienced by some populations reveals a scenario of water injustice since one of the most fundamental principles of justice is the principle of equity (Zeifert, 2019; Ribeiro, 2017). In many situations, the Human Right to Water may disregard socioeconomic injustices and local-scale power inequalities (Dupuits *et al.,* 2020).

The existing relationship between water and human survival has revisited the discussion on the impact of water availability over the inviolability, autonomy, and dignity of individuals, reinforcing the idea that access to water is directly linked to other rights that ensure individual survival (Villar, 2012). However, the complex nature of water resources causes various failures in water allocation during periods of scarcity, thereby compromising the security of this right (Gómez-Limón *et al.,* 2020).

The water supply crisis in the São Paulo metropolitan region

From late 2014 to early 2016, the water scenario in the São Paulo Metropolitan Region (RMSP) reached alarming proportions due to a lack of rainfall, marking the longest drought period in the past 65 years (Neto, 2016; Ribeiro; Buckeridge, 2018). It is important to highlight that this region has high water demands, especially due to its population density and the significant pollution caused by domestic and industrial effluents discharged into its waterways.

According to Neto (2016), there is a myth that this region naturally has little water. Critically, he argues that this myth stems from the fact that water resource management in the RMSP does not prioritize sewage treatment, turning all its channels, galleries, streams, and rivers into open sewage drains, unsuitable for supply. As a result, the RMSP population had to face the reality of water shortages during the water crisis (Marengo *et al.,* 2015; Alves, 2013). Fracalanza and Freire (2015) refer to this as a water supply crisis.

The crisis gained attention in the media and began to be reported daily (Custódio, 2015). Many news articles presented conflicting explanations that failed to clarify the true state of the RMSP's water supply system (Ribeiro; Buckeridge, 2018).

Under the mandate of the National Water and Basic Sanitation Agency (ANA), as established by the ANA Resolution No. 429/2004, the Department of Water and Electric Energy (DAEE) granted Sabesp the concession for the use of the Cantareira System's water resources to supply the RMSP through DAEE Ordinance No. 1213/2004, for a period of ten years (Sabesp, 2015).

According to Sabesp (2015), this concession limited the withdrawal flow from the Cantareira reservoirs, so that, under these circumstances, the withdrawal volume was set to vary between 24.8 and 31.0 m^3/s.

The rainy season in the Cantareira region usually begins at the end of September and ends in March, a period during which 72% of the annual precipitation for this area occurs (Marengo *et al.,* 2015). During this period, known as the hydrological year (Oc-

tober/13 to February/14), 444 mm³ of rainfall occurred in the Cantareira region, while the average is 995 mm³ (-55%) (Sabesp, 2015).

The water crisis cannot be attributed to isolated climatic phenomena, as was done by the São Paulo state government and Sabesp. According to Custódio (2015), although the drought was the most severe in recent decades, it is not a rarity in the history and geography of the region. From this perspective, according to Ribeiro and Buckeridge (2018), the decrease in rainfall cannot be considered the primary cause of this event, as it is not an unpredictable event but rather a natural, cyclical hydrometeorological phenomenon that can be forecasted with relative reliability (Neto, 2016).

In this regard, Martins et al. (2015) emphasize that the water management crisis in the state of São Paulo is the result of a lack of planning and non-compliance with the legislation in force in the country (at federal, state, and municipal levels). Failure to observe preventive measures can adversely affect the availability of sanitation services and lead to setbacks in their provision.

The lack of strategic planning and water resource management for the supply of the São Paulo Metropolitan Region exposed the system's fragility and was potentially the main factor responsible for the crisis. The need to consider climate change, population growth, and the conditions of water sources to project future water availability scenarios is evident. In these areas where the crisis was already underway, however, this was essentially crucial for water management and security (Araújo *et al.,* 2004).

Analysis of Water Injustice

Regarding the water shortage during the crisis period (2014–2016), it is evident that it occurred across all six districts. However, the districts of Brasilândia (70%), Capão Redondo (86%), Itaquera (70%), and Jardim Helena (70%) showed the highest percentage of positive responses regarding water scarcity during this period. Conversely, the districts of Perdizes (26%) and Santo Amaro (58%) recorded the highest percentage of negative responses, as shown in Figure 2. The districts identified as more vulnerable by this research, within the three supply systems, were also those with the highest number of respondents affirming to have experienced water shortages.

The "São Paulo Thermometer" survey (Datafolha, 2014) revealed that among the poorest, with a monthly family income of up to five minimum wages, 41% experienced water supply interruptions at home for five days or more in the days immediately preceding the survey, conducted in 2014. Among the intermediate-income population, earning between five and ten minimum wages, this rate dropped to 36%, and to 20% among the wealthiest, with family incomes above ten minimum wages.

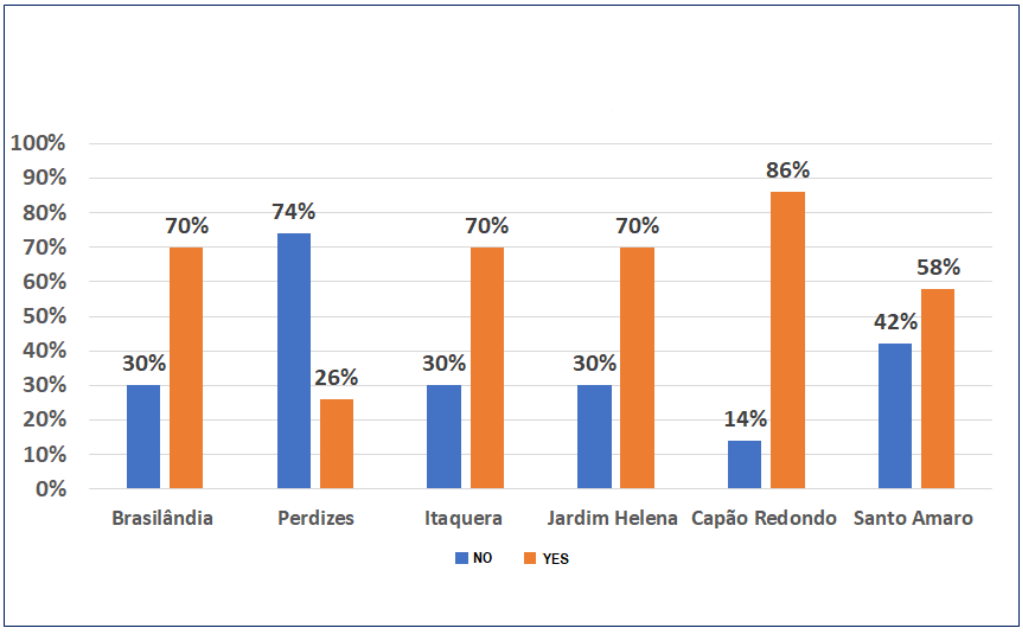
Information and news about water shortages indicated that the poor, living in peripheral areas, were much more affected by rationing than the wealthy (Lobel; Geraque, 2015; Arcoverde, 2015). According to Datafolha (2015), 58% of the poorest declared they had suffered from water shortages in the month prior to the survey conducted in 2015.

Considering socioeconomic conditions in the water resource management agenda,

it is crucial to emphasize how water scarcity affects the population unequally and

in various aspects of their lives. Public schools and daycare centers, for example, had to cancel classes, or when they did not, there were cases in which students had no water to wash their hands or use the bathrooms (Neira, 2015).

Figure 2: Graph of water shortages during the crisis period (2014–2016), with of % respondents



Source: Designed by the authors, 2023.

There were also reports such as that of a respondent interviewed by the newspaper *O Estado de São Paulo*, who stated that she did not have enough water to bathe or cook during hot summer days (Zanchetta, 2014). There were extreme cases such as one reported by *O Estado de São Paulo*, where a housewife expressed her primary concern was related to her daughter's personal hygiene, as her health condition required several baths a day (Ribeiro, 2014). Or another case that involved a resident who, after a day of work, reported being unable to take a shower because there was no water left when he arrived home, and his house did not have a water tank (Felix, 2014).

Figure 3 presents graphs showing the responses about the frequency of water shortages in each district where the questionnaires were administered. The "not applicable" option indicates that there was no water shortage on any day, according to the respondent.

In the Perdizes district, "not applicable" accounted for 74% of the responses, while only 26% reported water shortages. While in Brasilândia, positive responses about water shortages were distributed as follows: "one day a week," 18%; "two to four days a week,"

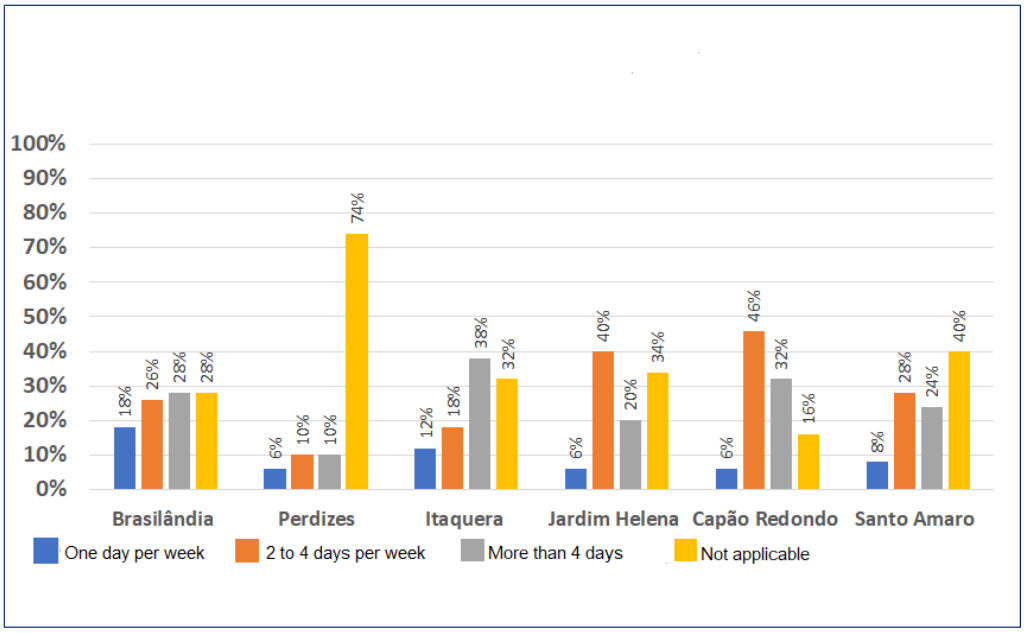
26%; "more than four days a week," 28%; and "not applicable," 28%.

In Itaquera, 38% of respondents reported water shortages on more than four days a week, 18% stated shortages occurred two to four days a week, and 12% indicated one day a week. In Jardim Helena, 20% reported shortages on more than four days a week, 40% stated shortages occurred two to four days a week, and 6% indicated one day a week.

The "not applicable" option yielded similar results in both districts, with 32% in Itaquera and 34% in Jardim Helena.

In the Santo Amaro district, 40% of the responses were "not applicable," 24% stated a lack of water for more than four days, 28% reported two to four days, and 8% indicated one day per week. Meanwhile, in Capão Redondo, 46% reported a lack of water "from 2 to 4 days," 32% stated "more than four days per week," 6% reported "one day per week," and only 16% responded "not applicable."

Figure 3: Frequency graph of water shortage by district during the crisis period (2014–2016), with % of respondents



Source: Designed by the authors, 2023.

The survey conducted by Datafolha in 2015 revealed that among respondents with an income of up to two minimum wages, 42% reported experiencing water shortages for five or more days per month; among those with an income between two and five minimum wages, 36%; and among those earning between five and ten minimum wages, 26%. Meanwhile, among those earning more than ten minimum wages, 19% reported

water shortages during this period (Datafolha, 2015).

Complaints about water shortages increased in September 2014 in the East, South, and North Zones, areas concentrating the poorest neighborhoods of the capital (Cardoso, 2015). In October 2014, residents of Jardim Romano, located in the Jardim Helena district, and neighboring areas in the East Zone of São Paulo also reported frequently facing dry taps at night (Felix, 2014). Although wealthier neighborhoods were not immune to the scarcity and not all low-income areas experienced water shortages, the impact on the poor and lower-middle class was reported to be disproportionate (Schmidt; Dezem, 2014).

In the aforementioned surveys and studies, water injustice becomes evident, as the water shortage was not experienced uniformly across all districts. Sabesp's strategies for managing the water supply crisis, whether by reducing water pressure in pipelines or

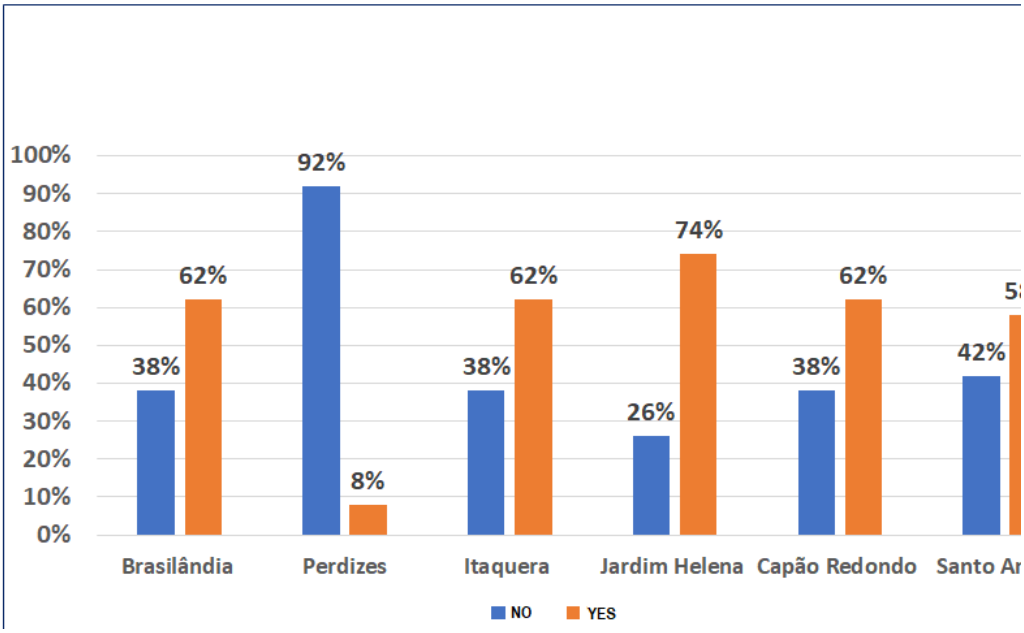
the amount of water distributed, affected peripheral and poorer neighborhoods more, leaving them without water for longer periods (Amorim; Cardoso, 2014).

When addressing the guarantee of the right to water access and water justice, socioeconomic differences are crucial aspects that need to be considered to ensure

equitable distribution (Dupuits, 2020). In times of scarcity, reducing inequalities in access is essential to meet everyone's needs (Carr *et al.,* 2015).

Regarding water quality, there were positive responses about perceived changes across all six districts. The number of negative responses (no perceived change in water quality) in the Perdizes district (92%) was higher, not only compared to Brasilândia (38%) but also to the other districts. In Jardim Helena, 74% of respondents reported noticing changes in water quality, while in Itaquera, 62% made this observation. In Capão Redondo, the figure was 62%, and in Santo Amaro, 58%. When comparing district pairs based on water supply systems, as shown in Figure 4, it is important to note that districts with lower vulnerability were also the ones that most reported no perceived change in water quality.

Figure 4: Graph of perceived changes in water quality during the crisis period (2014-2016) with % of respondents



Source: Designed by the authors, 2023.

In an article from April 2015, the newspaper *O Estado de São Paulo* published accounts from some residents of the far North Zone regarding water quality. For instance, a construction assistant reported smelling a foul odor from the water during a bath, a bricklayer mentioned noticing a brownish color in the water as soon as he turned on the tap, and, lastly, a more severe case involved a hairdresser and her daughter who experienced cramps and diarrhea after consuming the water (Leite, 2015).

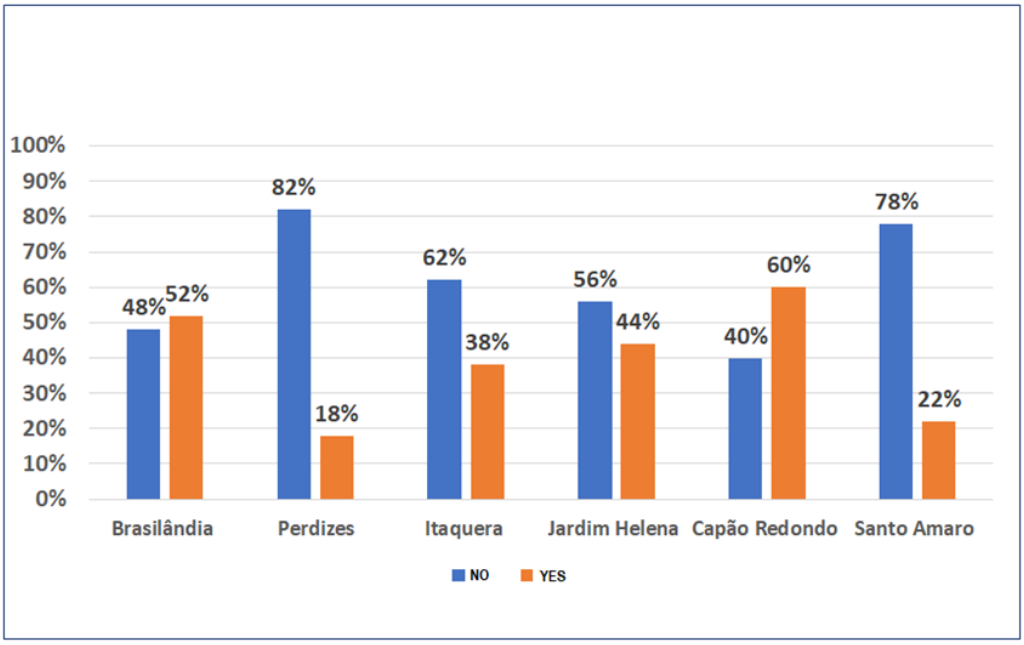
An important point raised by this article is that the water utility company or other competent authorities did not explain the cause of the water contamination, however, during this period, the then-metropolitan director of Sabesp stated that this was the region most affected by the reduction of pressure in the pipeline (Leite, 2015). Pressure reduction is achieved through the use of pressure-reducing valves in the pipeline. This reduction in the water distribution network can allow contaminants to enter the water system due to the lower pressure in the pipes and cause health issues for the population (Martins *et al.,* 2015).

Still regarding water quality, the newspaper *Agora São Paulo* also published a report in May 2014 denouncing that, in addition to water shortages, residents of the Cidade Líder neighborhood had been enduring for at least 15 days an unbearable foul odor coming from their tap water (Serra, 2014). Both articles highlight the poor water quality in low-income areas.

In such situations, it is possible to corroborate what Carr et al. (2015) pointed out: despite the availability of water, it was not suitable for consumption, meaning the basic need for access was not met due to the lack of conditions for consumption.

One of the tools used to induce consumers to save water was the contingency fee (fine) charged to customers whose monthly consumption exceeded the average recorded during the period from February 2013 to January 2014 (Sabesp, 2015). This strategy had a greater impact on respondents living in the districts of Capão Redondo (60%), Brasilândia (52%), and Jardim Helena (44%), as shown in Figure 5. When comparing the data from Figure 5 with those from Figure 2, it is possible to observe that these same districts had a high rate of positive responses regarding water shortages.

Figure 5: Graph of the influence of the fine on water consumption during the crisis period (2014-2016) with % of respondents



Source: Designed by the authors, 2023.

In addition to dealing with water shortages, residents of these districts also had financial concerns, as the existence of the fine influenced consumption. It can be noted that the concern about the fine imposed by Sabesp was lower among respondents from the districts of Perdizes (18%), Santo Amaro (22%), and Itaquera (38%). In districts where the population is less vulnerable, the economic problems associated with paying fines were not significant for respondents regarding water access.

Nonetheless, the implementation of the fine as a strategy to save water used by Sabesp throughout the metropolitan region highlights the need to understand issues within

population groups when making decisions to promote equitable water management. As Zwarteveen and Boelens (2014) affirm that, for water access, fair actions and procedures are necessary to ensure justice, which does not necessarily mean implementing equal actions but rather promoting equitable outcomes.

Final remarks

This study sought to analyze how water management in the municipality of São Paulo resulted in situations of water injustice during the water supply crisis between 2014 and 2016.

The data collected for this study revealed that Sabesp's action plan to manage the water supply crisis in São Paulo led to several situations that exposed a scenario of water injustice in the municipality. Water scarcity was a frequent topic in newspapers and other media, with constant reports on the state of the supply systems and complaints from residents alleging water shortages in their homes across various regions, especially in peripheral areas and those with greater socio-environmental vulnerability.

It is not possible to assert that water was lacking solely in areas with greater vulnerability or only in peripheral regions, as the contingency actions to reduce flows were applied across the entire urban area of the city of São Paulo served by Sabesp. However, during water scarcity, socioeconomic conditions exacerbate vulnerability and directly impact people's ability to access this resource. Therefore, in times of water shortage, such as the one experienced in São Paulo, the most vulnerable suffer the most. Considering that the less vulnerable demonstrate a greater ability to obtain water when necessary. This group of the population was precisely the one among respondents that least reported water shortages.

Differences in water access, both in quantity and quality, were observed between districts with higher vulnerability and those with lower vulnerability. In the more vulnerable districts, water shortages or the presence of water with unpleasant taste, odor, and even contamination were more frequent. The economic impact on water access is reflected in the mechanisms and resources available to less vulnerable and more vulnerable groups to cope with water shortages.

Faced with such a situation, people with greater economic capacity have an easier time accessing quality water, either by purchasing bottled water or using water through filters. Guaranteeing the right to water access mandates that these differences in both quantity and quality of access must be addressed.

The frequency of water shortages, measured by the number of days per week reported by respondents, also reinforces the notion of water injustice, as respondents from less vulnerable districts reported fewer days of water shortages. Although the measures adopted resulted in reduced water availability across the entire urban area, it was necessary to carefully consider the socioeconomic issues inherent to the population groups that make up the city of São Paulo.

Ensuring fair and equitable access to water requires attention to the fact that the same rules and regulations for water management are not equally applicable to all individuals, thus, social, economic, intellectual, and environmental particularities must be considered in decision-making for water management, especially during periods when supply is compromised.

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Vanessa Victor da Cruz de Souza
✉ nessavictor@usp.br
ORCiD: https://orcid.org/0000-0001-8161-5987

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Ana Paula Fracalanza,
✉ fracalan@usp.br
ORCiD: https://orcid.org/0000-0001-9289-0028

Pedro Luiz Côrtes,
✉ plcortes@usp.br
ORCiD: https://orcid.org/0000-0003-4160-4073

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Injustiça hídrica em período de escassez: uma análise do caso do município de São Paulo

Vanessa Victor da Cruz de Souza
Ana Paula Fracalanza
Pedro Luiz Côrtes

Resumo: Em tempos de crise hídrica, a gestão equitativa da água é essencial para garantir o acesso a todos os grupos populacionais. A crise hídrica enfrentada na região metropolitana de São Paulo entre os anos de 2014 a 2016 revelou, além dos conflitos pelo uso desse recurso, os riscos a que as populações socioambientalmente vulneráveis estão expostas quando há um período de seca. O presente estudo teve como objetivo verificar se o processo de gestão da água na cidade de São Paulo resultou em situações de injustiça hídrica durante o período da crise de abastecimento. Trata-se de um estudo de caso com análise estatística de dados coletados por meio de questionários. Os dados foram processados no software IBM SPSS ® e os resultados apresentados em gráficos. A análise dos gráficos permitiu compreender o impacto para os usuários do gerenciamento da crise realizado pela Sabesp.

Palavras-chave: Injustiça Hídrica; vulnerabilidade socioambiental; direito à água; abastecimento de água; Região Metropolitana de São Paulo.

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SciELO

Injusticia hídrica en tiempos de escasez: un análisis del caso de la ciudad de São Paulo

Vanessa Victor da Cruz de Souza
Ana Paula Fracalanza
Pedro Luiz Côrtes

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Resumen: En tiempos de crisis hídrica, gestión equitativa del agua es fundamental para garantizar acceso a todos los grupos de población. La crisis hídrica enfrentada en la región metropolitana de São Paulo entre los años 2014 y 2016 reveló, además de los conflictos por el uso de este recurso, los riesgos a los que están expuestas las poblaciones socioambientalmente vulnerables cuando hay un período de sequía. El presente estudio tuvo como objetivo verificar si el proceso de gestión del agua en la ciudad de São Paulo resultó en situaciones de injusticia hídrica durante el período de la crisis de abastecimiento. Se trata de un estudio de caso con análisis estadístico de datos recogidos través de cuestionarios. Los datos fueron procesados en el software IBM SPSS®, los resultados fueron presentados en gráficos. El análisis de los gráficos permitió comprender el impacto en los usuarios de la gestión de crisis realizada por Sabesp.

Palabras-clave: Injusticia del agua; vulnerabilidad socioambiental; derecho al agua,; abastecimiento de agua; Región Metropolitana de São Paulo.