São Paulo's 2013 water crisis: a socially constructed disaster risk

Crise hídrica em São Paulo de 2013: um risco de desastre socialmente construído

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doi:10.18472/SustDeb.v12n1.2021.38652

Received: 25/06/2021
Accepted: 15/10/2021

ARTICLE – VARIA

RESUMO

Frequent cases of water scarcity in Brazil reveal a water governance and administration crisis. During the water crisis (2013-2016), the São Paulo Metropolitan Region experienced a disaster scenario. This article analyses how it was constituted as a socially constructed disaster episode. A case study was carried out in the Novo Recreio neighbourhood (Guarulhos, SP) through ethnographic observations, interviews, and newspaper articles. The results were analysed based on the Pressure and Release Model (PAR). It was concluded that the water crisis period in SPMR has disproportionately affected the Guarulhos population, especially in Novo Recreio. Furthermore, the study demonstrated that public policies and the neighbourhood's territorial formation are related to its population's current frail living

conditions and increased socio-environmental vulnerability in the face of continuous water scarcity, thus corroborating the social construction of the risk of water scarcity.

Palavras-chave: Water. Water Scarcity. Socio-environmental Vulnerability. Environmental Risk.

ABSTRACT

Os frequentes casos de escassez hídrica no Brasil revelam uma crise de gestão e governança da água. Durante a crise hídrica (2013-2016), a Região Metropolitana de São Paulo vivenciou um cenário de desastre. O artigo analisou como a crise hídrica se constituiu como episódio de desastre socialmente construído. Foi realizado um estudo de caso no bairro Novo Recreio (Guarulhos, SP), por meio de observações etnográficas, entrevistas e reportagens de jornais. Os resultados foram analisados com base no modelo Pressure and Release (PAR). Concluiu-se que o período de crise hídrica na RMSP afetou desproporcionalmente a população de Guarulhos, em especial a do Novo Recreio. Demonstrou-se que as políticas públicas e a formação do território do bairro estão relacionadas com a condição frágil de vida atual da população e que aumentaram a condição de vulnerabilidade socioambiental ante a falta de água contínua, portanto, corroboram a construção social do risco da escassez hídrica.

Keywords: Água. Escassez hídrica. Vulnerabilidade Socioambiental. Riscos Ambientais.

1 INTRODUCTION

An impact of climate change is the more frequent experience of extreme drought or flood events. The Economic Commission for Latin America and The Caribbean (ECLAC, 2015) shows that temperature and precipitation patterns change significantly in Latin America and Caribbean countries. Temperature changes affect the precipitation, humidity, and runoff water patterns, decreasing economic activities and water availability for humans and animals. In addition, authors increasingly note that climate variability contributes to the hydric stress of specific populations (BATES et al., 2008; ECLAC, 2015).

São Paulo Metropolitan Region (SPMR) faced a severe drought period named "crise hídrica1" from 2013 to 2016. The event was driven by an unexpected climatological episode of low rainy season precipitation, which was expected to refill the Cantareira reservoir, the main São Paulo reservoir (COELHO; CARDOSO; FIRPO, 2016; MARENGO; ALVES, 2015; NOBRE et al., 2016). However, researchers also highlighted how water supply and water resource management were affected by poor and non-precautionary institutional governance in SPMR (FRACALANZA, 2016; FRACALANZA; FREIRE, 2016; JACOBI; CIBIM; LEÃO, 2015; JACOBI; FRACALANZA; EMPINOTTI, 2017; RIBEIRO, 2011).

Regarding this discussion, the study aimed to understand specific local conditions and public policies involved in how this water crisis had enhanced population vulnerabilities to a disaster point of a lack of water supply. During the crise hídrica, there were reports of households without water for long periods of the day, an increase of informal ways to reserve water, the increase of water and energy costs, and some areas attended by water tankers. However, those effects were not equally distributed around the SPMR and the state. Water scarcity and drinking water provision revealed an unequal resource appropriation and lack of mitigation and adaptation planning for climate variation (FRACALANZA, 2016; MARENGO et al., 2016; SORIANO et al., 2016).

Such impacts can be addressed scientifically as a drought disaster. However, the disaster is not an exceptional natural event of wild nature. Since humans interact, modify and build their socio-political relations, related risks are also produced (BECK, 2011; SORIANO et al., 2016; VEYRET, 2007). Oliver-Smith et al. (2017) argue that tropical storms and droughts can be conveniently classified as natural events, but it is important to note that anthropogenic actions have already modified nature. Especially in cases of drought, natural environments have been modified fundamentally by water and soil use and their management.

Even before disaster events occur, the risk of them happening is known. Sociologists and geographers focus on the vulnerabilities that reinforce a risk and lead to a worse disaster scenario. Most risks are part of peoples' daily lives preceding any extraordinary weather phenomenon. Wisner et al. (2003) explain that exposure differs according to social class, gender, ethnicity, age, disability, etc. Those vulnerability conditions which people are exposed to are directly related to social systems and power instituted by different groups. Therefore, people are more or less harmed depending on their socio-environmental vulnerability.

Thus, the article aims to analyse how the crise hídrica is a socially constructed disaster through the case study of a peripheral SPMR neighbourhood named Novo Recreio in the Guarulhos municipality. For that purpose, the study is based on ethnographic observation, interviews and journalistic reports. The results were analysed through the Pressure and Release Model (PAR) formulated by Blaikie et al. (1994) and Wisner et al. (2003).

Firstly, the article presents the scientific literature about disasters and risks to highlight their relevance and water management. The second topic exposes the case study context grounded in the Novo Recreio neighbourhood. The third topic presents the PAR Model and analyses it to explain how people vulnerabilities enhanced the impacts of the drought. To end, the authors identify new variables to understand urban water scarcity management and point to conditions disregarded by policy-making in SPMR, especially in climate change scenarios.

2 DISASTERS AND RISK AS SOCIO-POLITICAL CONSTRUCTION

The United Nations International Strategy for Disaster Reduction (UNISDR) defines risk as a combination of an event's probability and its negative consequences. Further, the risk is also conceptualised as a statistical expression of damage or economic loss (CASTRO, 1998; UNISDR, 2004). This view understands risk as a disorder in natural environments that the episode's probability and intensity can quantify. The 'hard' sciences mainly work with this perception and create mathematical models to explain and solve disaster risk. However, the social sciences have studied the causes of disasters to identify socio-environmental variables that influence the occurrence of catastrophes.

Beck (2011) brought a sociological lens to environmental and technological risk to understand that western society is a risk society. The author defined the society of risk after all the catastrophic events during the 1980s in Europe. The sociologist argued that western society has lived under radical uncertainty dynamics, which have produced risk conditions with global effects. While bearing this in mind, it is crucial also to frame the specific experience of Latin America, where twentieth-century modernisation created extraordinary urban inequality. Dealing with disaster calls for engaging with the 'modern' complexities of uncertainty and unpredictability that capitalist development has brought forth.

Furthermore, risks are defined through processes of negotiation that need to be understood through normative and symbolic dimensions mediated by social interaction and institutions (BECK, 2011; BOSCO; DI GIULIO, 2015). This risk perspective assumes that there are cultural aspects between the hazard and risk perception. The systematic dispossession, self-construction and improvisation in daily life experiences had built knowledge, and social practices shared among social groups (BOURDIEU, 2004; SPINK, 2014; VALENCIO et al., 2009; WARNER; ENGEL, 2014). The psychological and cultural dimensions of risk are fundamental to understanding the acceptability and hierarchy of certain risks, besides others (MARANDOLA; HOGAN, 2006; SPINK, 2014; WARNER; ENGEL, 2014).

The situation of a social dynamic rupture involves housing, public health, work, authority patterns, social rules and cultural norms disruption, i.e. it defines the social meaning system rupture and consequently shows a limitation to population routine and the need to build a new social dynamic. This is the experience of a social crisis (SENA; VALENCIO, 2008).

During 2015, said to be the worst crise hídrica period in SPMR, Guarulhos's public water and wastewater company (Serviço Autônomo de Água e Esgoto – Saae) intensified water rationing through intermittent provision because the water supply company (Sabesp) decreased the sale of freshwater. This situation imposed profound alterations for Guarulhos's population.

Nevertheless, disasters are produced in everyday life (MARCHEZINI et al., 2017; OLIVER-SMITH et al., 2017; QUARANTELLI, 2016; SPINK, 2014; WISNER et al., 2003). Most disasters are created by normalising risks and the trigger of a hazard, resulting in a socio-environmental rupture. Furthermore, how private and public institutions, NGOs, the media and other social actors define and structure a disaster is essential because they instruct how policies and practices address it.

In the crise hídrica case, São Paulo's government delayed announcing a water scarcity situation due to the elections. It was a period of uncertainty, lack of transparency, and contradictory information (JACOBI; CIBIM; LEÃO, 2015; TADEU, 2016). In Guarulhos, it resulted in a robust and broad campaign for household water economisation to prevent water waste and amplify intermittent drinking water supply.

That decision-making suggests that the municipality of Guarulhos was under water stress for an extended period before the climate hazard. In that sense, it is necessary to examine the vulnerability levels of different social groups, which results in significant social and environmental pressure without observation of the drought hazard (MARCHEZINI; WISNER, 2017; WISNER et al., 2003).

Disaster vulnerability analyses began with 1970's disaster studies that argued the disasters occurred more as a consequence of socio-economic than natural factors (O'KEEFE; WESTGATE; WISNER, 1976) and were, then, followed by Chambers' (1983) development studies, and consolidated in the 1980s and 1990s in a series of books and articles (among them, BLAIKIE et al., 1994; BOHLE; DOWNING; WATTS, 1994; CUTTER, 1996; HEWITT, 1983). Understanding structural vulnerabilities related to race, gender and ethnicity also played an essential role in this perspective.

Vulnerability is distinguished by the characteristics of a person or a social group and the living context that influences their capacity to anticipate, cope with, resist and recover from a hazard impact (WISNER et al., 2003). Vulnerability studies have been done by numerous researchers from diverse theoretical, methodological and ontological premises (ADGER, 2006; ALVES; TORRES, 2006; FREITAS et al., 2012; MARANDOLA; HOGAN, 2006; MARTINS; TAVANTI; SPINK, 2016; O'BRIEN et al., 2013; PORTO, 2011; SPINK, 2014, among others).

In Brazil, Martins, Tavanti and Spink (2016) observed that empirical studies tend to associate more than one condition type of vulnerability, which explains the tendency of researchers to add words to "-vulnerability" to delimitate knowledge fields and governmental interventions. The concept of socio-environmental vulnerability arises through social and environmental overlapping where environmentally degraded areas are superimposed with deteriorating social conditions, amplifying hazard effects and damages (TORRES, 2000). Mainly, this is a current environmental problem scenario where fragile conditions have accumulated in territories as a product of late modernity, by pillaging and segregation processes of socio-environmental inequality (COATES, 2019; LEFF, 2001; MARTINEZ-ALLIER, 2007). In sum, socio-environmental vulnerability results from socio-economic structures that produce precarious living conditions and deteriorated environments that precipitate lower resilience and risk reduction capacity (FREITAS et al., 2012, p. 1578-1579). Thus, historical processes made up of cultural, social, environmental, political and economic contexts are imbricated in patterns of urbanisation that lead to hazard exposure as a result of marginality and access to resources (BANKOFF; FRERKS; HILHORST, 2004; CARDONA et al., 2012; WISNER et al., 2003).

To understand this process, methods and tools have been developed to quantify, index and map vulnerability; conversely, qualitative analyses try to understand community coping capacities involving all social actors, including external expert contributions in action and prevention of risks. Additionally,

there are other frameworks dedicated to empowering society as a broad political agenda. Examples of these models include the socio-ecological model (TURNER et al., 2003), the Pressure and Release (PAR) model (BLAIKIE et al., 1994; WISNER et al., 2003), Community-Based Disaster Risk Management (CBDRM), the Vulnerability and Capacity Assessment (VCA), the Hazards-of-a-place (SoVI – Social Vulnerability Indices) (CUTTER, 1996, 2003; CUTTER; MORATH, 2013), and Social Amplification of risks (KASPERSON et al., 1988).

The present study focuses on recognising the social, economic, and political processes that contribute to increased vulnerability, risk and understanding this process through 'micro' means, practices, and places of daily action. This perspective is embedded in the disaster and political ecology fields. The proposition emphasises the social conditions and root causes of a fragile context, resulting in a cumulative progression of unstable conditions to deal with a threatening situation. Further, this is related to an unequal distribution of risks within specific areas and social groups, resulting in vulnerability and revealing structures of injustice and racism. Indeed, Porto (2011) criticises disaster and vulnerability approaches that do not consider historical origins that transform people's level of vulnerability. The author argues that only accurate historicity can rescue the condition of a citizen-subject of rights (DAGNINO, 2004).

In this sense, the Pressure and Release model is a groundwork that constructs components to explain the increase or decrease of risk probability (BLAIKIE et al., 1994; WISNER; GAILLARD; KELMAN, 2011). The PAR model considers two broad categories – root causes and dynamic pressures – intrinsically bound and generate fragile livelihoods and unsafe conditions and locations. The root causes are related to long-term characteristics such as nations' social and economic structures and their histories and cultures and affect policies and societal relations. In comparison, dynamic pressures are related to short- to medium-term characteristics, including lack of local institutions, local investments, and macro-forces such as rapid population change and development and the world economic market fluctuations. As a consequence of those patterns, the way populations build their lives could result in fragile livelihoods and unsafe conditions. To this extent, the PAR model promotes the consideration of drought disaster beyond a lack of water, bounded within and unearthed inside day-to-day practices in Novo Recreio.

3 WATER SCARCITY ON SPMR: NOVO RECREIO CASE STUDY

Guarulhos, the second biggest city in São Paulo State, has suffered intermittent water supply since 1991. The municipality is located in the Alto Tiete Basin and has two surface dams (Cabuçu and Tanque Grande) joined to underground water supply sources and are responsible for around 12% of the drinking water supply. The other 88% used to be bought from Sabesp2 until 2018. During the crise hídrica, Sabesp attempted to solve the problem by decreasing the water volume transferred to Guarulhos, mainly to benefit São Paulo city. Consequently, under the pressure of water undersupply, SAAE intensified water provision rotation among 17 neighbourhoods in Guarulhos. One of them is Novo Recreio, which has around 4.600 inhabitants living in Cantareira Park, a 'Permanent Protected Area' for environmental conservation. Before the crise hídrica, the household water supply followed this scheme: one day of water provision (24h) alternating with one day without it (24h). However, during the water crisis, the water provision intermittence escalated to 30 hours without water provision and only 18 hours with water supply.

This scenario resulted in a vital concern for public health conditions. Low water provision affects water quality because people search for private means of dealing with the shortage. Firstly, the type of individual response depends on economic conditions: whether to buy bottled water or pursue expenditure for a bigger water tank. Furthermore, the absence of sanitation and housing infrastructure prompts a rise in the prevalence of waterborne diseases, made worse by a lack of public policy in this area (CASTRO, 2010; PAZ; ALMEIDA; GÜNTHER, 2007; VALENCIO, 2009). In Brazil, since 1997, water

management has been based on decentralised, participative and integrated principles. The National Hydric Resources Policy (Federal Law 9.433/1997) determines human and animal drinking water provision as priority users, especially in drought cases. However, Fracalanza (2016) points out that there is unequal water distribution in São Paulo's society, where water access management is addressed to wealthier areas based on the decision making by those who capture and distribute it and thus who can profit and derive economic value from what is ultimately a common good. Sabesp and São Paulo's government decision-making during the water crisis opposed the National and State Water Policies that highlight water as a social resource (São Paulo Law 7.663/1991). Likewise, after the Constitution of 1988, water and sanitation services faced a lack of policies and regulations for the sector. In 2007, it became regulated by the National Basic Sanitation3 Law (11.445/2007)4. This regulatory mark was considered a considerable advance, achieved directly due to social movements' efforts, including those by researchers and other area specialists. It warranted universal access to sanitation services as a citizen right, alongside an approach focused on local parameters and social-institutional control.

Consequently, water resources management laws and the water and sanitation services law consider themselves different administrative sectors instead of an integrated management service. This misconception can lead to unfavourable trade-offs between water reservoir storage and water supply management. Also, in SPMR, it has led to the appropriation and privatisation of water (CUSTÓDIO, 2012; FRACALANZA, 2016; SANTOS, 2021).

Considering this water dilemma and the crise hídrica event, the methodology of this study was developed between 2017 and 2019. This was a qualitative investigation case study (YIN, 2010), based on ethnographic observation registered in a field diary and home visits and qualitative semi-structured interviews with local water managers.

First contact was made to identify locations for the study, gain recognition and establish a good rapport with the community. The healthcare assistants from Novo Recreio's Health Basic Unity and the managers of the Non-Governmental Organization Clube de Mães were the facilitators between the researchers and the dwellers. The twenty home visits and the territory recognition revealed managers and practitioners to be interviewed. Following the snowball technique, the researchers interviewed 13 municipality employees from Saae, Housing and Environmental Secretariats, and two people from the organised civil society. Furthermore, Guarulhos news and official data on local policies related to water supply were collected from Guarulhos Sanitation Policy5, Instituto Brasileiro de Geografia e Estatística6 – IBGE and the Novo Recreio's Health Basic Unity (Unidade Básica de Saúde – UBS Novo Recreio)7. This methodology and study were approved at the Ethic Council as part of the ResNexus Project8.

Later, the results were triangulated to fulfil the categories used by the PAR model. Mainly, the root causes were related to the neighbourhood construction in Guarulhos and SPMR urbanisation. Next, the dynamic pressures and fragile livelihood conditions were triangulated among the house visiting, interviews and official data. Then, the natural hazards were the severe drought and the landslide risk. Finally, the results were combined and critically analysed, indicating the patterns shown in Figure 1 as the flowchart of Novo Recreio's case study.

4 ESTABLISHED WATER CRISIS: A DAILY DISASTER IN NOVO RECREIO

At the beginning of fieldwork, it was observed that Novo Recreio's residents seemed unconcerned about the lack of water provision and that the crise hídrica appeared to be just a temporary condition. The field experience showed that people were used to living without a public water supply. Plus, poverty, the absence of other public infrastructure, and other competing daily risk situations (landslide, expropriation, violence, others) presented greater demands, as a dweller said,

> "Our neighbourhood, you know, it is a recent neighbourhood without any structure despite that our water access is not so difficult like that. We have one day to another without a water supply. Other neighbourhoods stay almost one week without water access [...] we are privileged because there are worse places than ours".

In this sense, Spink (2014) highlights that risk perception needs to consider the meaning of the behaviour considered a risk and the risk behaviour's processes taken by the inhabitants and the hierarchisation of the risks through benefits and costs associated with other risks. Then, the water public disarrangement in Guarulhos and the poor water access as a reality experienced by Novo Recreio's inhabitants created a social imaginary of water scarcity as "everyone's problem". It was reinforced by the local government and the media when public action increases the lack of water supply by saying "people need to avoid wasting water" even if they do not have proper water access.

Moreover, in the face of this normalised situation, other risk and infrastructure problems are hierarchised, such as public transport access, public health service access and the risk of housing displacement. Therefore, a socio-environmental vulnerability condition reveals risk situations that are not external natural factors but also determined by social, political and economic aspects of the social systems (OLIVER-SMITH et al., 2017; SPINK, 2014; WISNER et al., 2003).

This scenario explained how people live under socio-environmental vulnerability and risk. Likewise, the results revealed a progression of vulnerability rooted in Brazil's historical development followed by policies made based on inherited values when applied to the Novo Recreio's neighbourhood create a risk area. Respectively, we present below the PAR model scheme analysed for Novo Recreio (Figure 1).

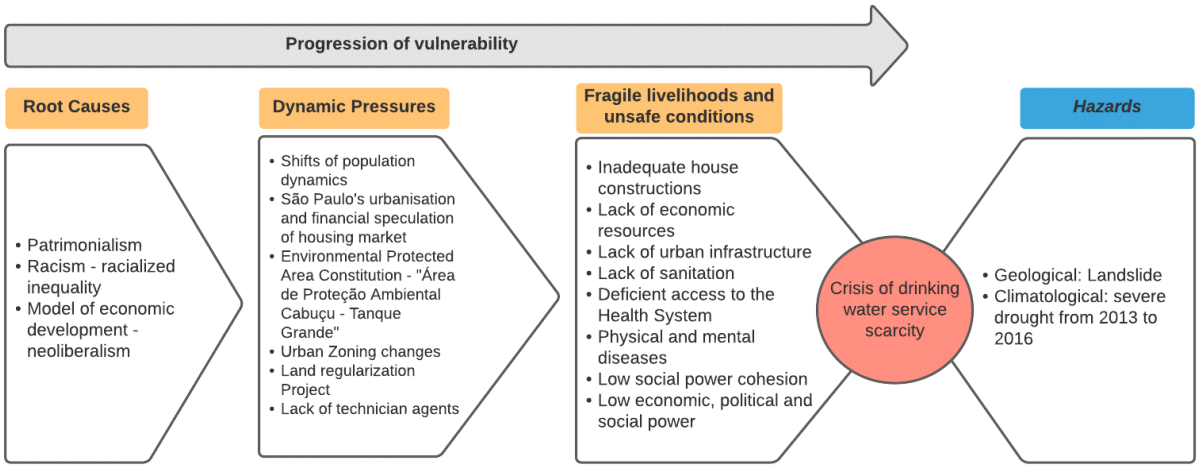

Figure 1 | PAR Model flowchart of Novo Recreio's case study.

Source: SANTOS, 2021

The diagram demonstrates that socio-economic factors boosted Novo Recreio residents' vulnerability to drought disaster conditions during 2013-2016. Beyond this, it illustrates intermittent water supply services in the territory due to historical, economic and social processes, which led to a generalised water scarcity supply, regardless of an external atypical climate factor.

Brazil's colonial period created a societal dynamic based on an exchange of favours, clientelism and patrimonialism where high society people have access to properties based on their social and economic power. In consequence, mainly poor black former enslaved people and their descendants were placed on the margin of this societal relation (ALMEIDA, 2019; JESUS, 2017; NASCIMENTO, 2016), enhancing racialised inequalities through public policies that kept those people at the bottom of society (usually, located in risky peripherical areas) (COATES; NYGREN, 2020; MARICATO, 2015; VALENCIO, 2008).

Later, the capitalist development model, followed by neoliberalist geopolitics, generated historical inequality patterns strongly related to Brazil's entrance into the international economy as an exporter of raw materials and rural and metallic commodities (PORTO; MILANEZ, 2009). The neoliberalist agenda transformed São Paulo's territorial organisation and its role in national economic policies, affecting Guarulhos as a "supporter" municipality to the São Paulo metropolis. Guarulhos contains Latin America's most prominent international airport, and it is known as an industrial region. For Adger (2006), Hogan and Marandola Jr (2006), economic globalisation contributed to increasing vulnerability, mainly in social and economic aspects, as a result of trade liberalisation as a new stage of "colonialism".

These historical processes are considered root causes for the progression of vulnerability to Novo Recreio's inhabitants because these inherited patterns have conducted societal relations and characterised political values and preferences until today. Brazil's development process may have other aspects not discussed in this study because only those listed above were identified during fieldwork and interviews.

Changes to Guarulhos's role in the development of São Paulo's metropolitan area impacted Novo Recreio's creation and further consolidation (CARVALHO, 2010). Therefore, changes in the macro politics scenario, the increase of industrialisation and the housing speculation and gentrification of São Paulo city drove the appearance of peripheral neighbourhoods to shelter migrant workers from Brazil's northeast in the 1970s and later, incentivised by the city's economic growth (OLIVEIRA, 2008). Consequently, rapid urbanisation occurred, with shifts in São Paulo's city economic and social dynamics in the financial capitalism era. As a result, the low-income classes had to move to cheaper areas, mainly on the city's border where there are landslide risks, lack of public infrastructure and generally in areas dedicated to water and forestry conservation, in São Paulo's peripheries (as Guarulhos, in SPMR) (JACOBI, 2006; MARICATO, 2006, 2015).

Novo Recreio has been created and consolidated in this context. One dweller said, "I live in a conservation area, it is not right where I live. Although, it was the place I found to live. I paid R$ 700.00, but they [the local government] can take us off at any time (dweller, 2018)". These pressure dynamics show that the São Paulo capital urbanisation induces the population movement to Guarulhos in the metropolitan region as a supplementary municipality in this territorial organisation (CARVALHO, 2010). Accordingly, the Guarulhos urbanised area has grown toward illegal settlements where the land use is made by negotiating cheap and inappropriate land.

Land ownership in Novo Recreio is still undefined juridically, although old elite families are now requesting the area's ownership. This notwithstanding, many politicians have promoted the illegal occupation of Novo Recreio through the 20th century. Racialised land occupation in Guarulhos territory has also been observed. Guarulhos has approximately 1,349,113 inhabitants (53,34% white, 45,27% black), 63% of Novo Recreio's residents identify as black and 36% as white (IBGE, 2010). De Jesus (2020) pointed out that black Brazilians continuously experience an absence of sanitation and resultant environmental health impacts.

Due to this chaotic but designed urbanisation, the Guarulhos municipal authority created the Cabuçu-Tanque Grande Protected Environment Area in 2010. However, until 2019 there was no management plan for the area that could organise territorial land use. Also, by 2011 Guarulhos was categorised as "urbanised" within an urban zoning plan, and Novo Recreio was located in a zone of recovery and sustainable use. Considering those legal aspects and landslide risks, São Paulo's Environment Public Minister prosecuted Guarulhos city hall for removing families in the risk area to restore it to its natural condition. From that, a land regularisation project started, and it resulted in the displacement of 437 families, effectively a war scenario due to the construction debris resulting from housing demolitions. The most hazardous area in Novo Recreio was in the middle of the territory, Taquara do Reino's watercourse. There was a high landslide risk because of the hill's geomorphological conditions besides the drainage watercourse.

In the end, the project was discontinued due to a flawed planning process and a review of its budget by Caixa Econômica Federal (one of Brazil's federal banks), the finance provider. The planners did not project other physical risks due to the demolition process. For example, these houses are constructed along the hill and, usually, there are different houses down the hill. Some were half-demolished because they did not see that the structure could fall out on other houses placed on the other hill face. Moreover, the demolition debris had stayed there during the study period. "It is looking like Syria. It is a war scenario when you see a house without the roof by one side" said another dweller.

The insecurity related to land property is a vulnerability indicator (HEIJMANS, 2004; WARNER; ENGEL, 2014). It represents the contradiction that even though these territories are legally protected, they are not protected by licensing and compliance agencies. Thus, environmental protection remains highly unequal across classes and ethnicities (ACSELRAD; MELLO; BEZERRA, 2009).

These dynamic changes to the territorial organisation and frequent displacement directly threaten livelihoods in Novo Recreio because they define how and when residents will have access to public services and of what quality. Thus, unequal wealth appropriation and democratic fragility are fundamental to a structural conflict in territorialisation and presenting socio-environmental specificity to hazard impacts (VALENCIO, 2008, p. 5).

Novo Recreio's population has occupied this area to escape from unaffordable high rental values. Therefore, the possibility of having their own house, illegally sold at a low price was the only way they could solve their housing problem. Furthermore, their economic condition determined the housing type, almost always built with inadequate materials that would not support a water tank, for example.

Living in a risky and protected area well known by the State did not guarantee basic urban infrastructures such as sanitation, water supply, public transportation, public health, and street lighting services. Vulnerability is associated with social disadvantages that produce poverty and simultaneously reflect and produce this poverty itself (HOGAN; MARANDOLA JR, 2006, p. 27). Thereupon, Novo Recreio's residents are directly affected in their daily life through a vicious cycle of disease provoked by waterborne diseases and arboviruses. The UBS Novo Recreio reported an increase in diarrhoea and dengue fever cases in 2015, the same period that people reserved more water in inadequate plastic tanks. Also, mental health disorders were identified due to the precarious living condition, relating psychological, subjective and symbolic dimensions to the racial stigmatisation behind the lack of sanitation for black bodies (DE JESUS, 2017).

Analysing all these aspects, the PAR model showed how the socio-economic structures of regional and local urban development have influenced the organisation of territorial space and the fragile living conditions and differentiated water supply. Accordingly, in extreme climate episodes, the disaster is already present. That is why the crise hídrica was a disaster event manufactured through root causes and dynamic socio-political pressures that culminated in a drinking water shortage.

Disaster episodes are better understood as unfolding pathological systemic changes once they are bound to the social, economic, cultural and political problems, roots that explain the transformation of vulnerability and hazard into a catastrophe (OLIVER-SMITH et al., 2017).

Many disaster managers and political decision-makers do not work with social and cultural aspects because they seem immutable or complex. However, these problems also do not disappear, resulting in three dilemmas: 1) a silence regarding the risk of disaster creation, 2) the development myth, and 3) the dominance of a security paradigm (LAVELL; MASKREY, 2014). Acknowledging the genesis of disaster on a temporal scale brings forward questions concerning intergenerational equity and ethics about the meaning of sustainable development. Blaikie et al. (1994) and Wisner (2016) ask what sustainability and development we are chasing.

The authors have clarified that the root causes are more difficult to change, but it would not be an excuse not to understand it and address dynamic public policies to reduce socio-environmental risks (BLAIKIE et al., 1994; WISNER; GAILLARD; KELMAN, 2011). Additionally, Jasanoff (2013) argues that the political practitioners should be open to thought deconstruction since, in the face of uncertainty and complex contemporary problems, only scientific information and expert speech are incapable of defeating the scepticism of people who are at different social positions with diverse social interests.

A change in view towards the water crisis as a disaster represents opportunities to improve water management and governance in São Paulo, putting climate and social problems together to change the technology-neutral paradigm to a transparent, resilient, citizen-based urban development.

5 CONCLUSION

The study demonstrated that despite the climate change dynamics and the recent drought event in SPMR, the population had already faced water scarcity. This water supply scarcity is related to a set of politics and structures that configure relations on the territory and, consequently, to the drinking water access.

In this sense, the progression of vulnerability throughout the years can impact the population financially and structurally to a point where they could not cope with or recover from a disaster. Regarding the extended drought from 2013 to 2016, the article concludes that the "crise hídrica" was a socially constructed disaster.

The lack of fresh water and the intermittent water supply discourse legitimises a precarious water supply service in Novo Recreio rooted in the rhetorical speech of the population's water waste and illegal settlement. This discourse contributes to the Novo Recreio population not perceiving the lack of water as an essential risk since lack of water supply is normalised, and risks are tiered in the face of the inequality scenario they experience in Novo Recreio.

The study found drinking water supply inequalities in Guarulhos compared to São Paulo city; it also observed impacts of the lack of drinking water supply to the Novo Recreio's inhabitants, which perpetuate unsafe health conditions that maintain a vicious cycle of disease-health-disease and the population under socio-environmental vulnerability condition.

The scenario identified in Novo Recreio is the perpetuation of a constant and dynamic cycle of socio-environmental vulnerability, as reported in the results. Intermittent water supply in Novo Recreio affects the population's physical and emotional health conditions through waterborne diseases and unsanitary territory and housing conditions, which preserve a racial stigma for its people, mostly black, who are unable to keep proper sanitation and, lastly, suffer consequences on job opportunities and sociability.

Most of the studies are searching for climate variability models to explain and/or predict weather extremes, but just a few are looking for these events' political and social impacts. Despite that, based on these discoveries, the article argues that the view on water crisis must be redirected toward a disaster view, since, by regarding it in such a manner, water stress and lack of water supply are understood in their anthropic dimension, and not as an isolated and unexpected natural event. Therefore, water scarcity is a technological risk because human relations in the territory directly affects water quality and quantity conditions.

NOTES

1 | The period of severe water scarcity in SPMR was known as “crise hídrica” (water crisis, literally translated). This article uses the Portuguese expression to emphasise the definitive meaning “The water crisis” and the additional local subtext the phrase has gained.

2 | During this research, the water and wastewater service owner in Guarulhos changed from Saae (a municipal autonomy company) to Sabesp (a State company), in 2018.

3 | In Brazil, essential sanitation services include water distribution, sewage collection and treatment, urban drainage and solid waste.

4 | In 2020, an alteration was approved to the Sanitation Federal Law 14.026/2020.

5 | Decree n. 30.840, from May 9th, 2013 – approves the Municipal Plan for Water Supply and Sanitary Sewage of the Guarulhos Municipality.

6 | IBGE census, 2010.

7 | Official data regarding socio-economic characterisation, waterborne diseases, and vectors provided by the UBS Novo Recreio and Guarulhos Health Secretary.

8 | Resnexus Project – Resiliência e vulnerabilidade quanto ao nexo urbano de alimentos, água, energia e ambiente (Fapesp process n. 15/50132-6).

ACKNOWLEDGMENTS

The authors are thankful to the Coordination for the Improvement of the Higher Education Personnel (Capes) for their financial support.

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