

Political ecology and basic sanitation: Analysis from the metropolitan periphery of the Rio de Janeiro

Ecología política e saneamento básico: Análise a partir da periferia metropolitana do Rio de Janeiro

Ecología política y saneamiento: Análisis de la periferia metropolitana de Río de Janeiro

André Santos da Rocha
Federal Rural University from Rio de Janeiro
asrgeo@ufrj.br

Leandro Dias de Oliveira
Federal Rural University from Rio de Janeiro
leandrodias@ufrj.br

Abstract

Access to water supply and sewerage networks are essential elements of basic sanitation, however, access to these networks is conditioned to exclusionary models and reflects an unequal way of reproducing space. There is a need to critically think about a political ecology that assesses the conditions of this supply and reveals the asymmetries in times marked by neoliberalism, which incorporates, from the new legal framework, new directions for sanitation policy in the country. Thus, the present text aims to present a critical view from the existing realities on the periphery of the outskirts of the metropolis of Rio de Janeiro - extracted from the segment of the Metropolitan Far West - given the current context of privatization (concession) of supply services and wastewater collection. Access data are used based on IBGE and SNIS and a cartography that explains the differences in access to such services in the Far West Metropolitan Fluminense, having its exemplification from the case of the city of Paracambi

Keywords: Access to water and sewage; Neoliberalism; CEDAE privatization; Inequalities.

Resumo

O acesso as redes de abastecimento de água e de esgotamento sanitário são elementos essenciais do saneamento básico, todavia o acesso a essas redes está cada vez mais condicionada a modelos excludentes e refletem a forma desigual de reprodução do espaço. Existe uma necessidade de se pensar criticamente uma ecologia política que avalie as condições desta oferta e revele as assimetrias em tempos marcados pelo neoliberalismo, que incorpora, a partir do novo marco legal novos rumos para política de

saneamento no país. Assim, o presente texto objetiva apresentar um olhar crítico a partir das realidades existentes na periferia da periferia da metrópole do Rio de Janeiro – aqui recortada a partir do segmento do Extremo Oeste Metropolitano – diante do atual contexto de privatização (concessão) dos serviços de abastecimento e coleta de esgoto. São utilizados dados de acesso com base no IBGE e no SNIS e uma cartografia que explicita as diferenciações de acesso a tais serviços no Extremo Oeste Metropolitano Fluminense, tendo sua exemplificação a partir do caso da cidade de Paracambi.

Palavras Chave: Acesso à água e esgoto; Neoliberalismo; Privatização da CEDAE; Desigualdades.

Resumen

El acceso a los sistemas de abastecimiento de agua y alcantarillado son elementos esenciales del saneamiento básico. Sin embargo, el acceso a estos sistemas está cada vez más condicionado a modelos excluyentes que reflejan la forma desigual de reproducir el espacio. Es necesario pensar críticamente una ecología política que evalúe las condiciones de esta oferta y revele las asimetrías en tiempos marcados por el neoliberalismo, que incorpore, a partir del nuevo marco legal, nuevos rumbos para la política de saneamiento en el país. Así, el presente texto pretende presentar una mirada crítica sobre las realidades existentes en la periferia de la periferia de la metrópolis de Río de Janeiro - aquí recortada del segmento Extremo Oeste Metropolitano - frente al actual contexto de privatización (concesión) de los servicios de abastecimiento y recolección de alcantarillado. Se utilizan datos de acceso basados en IBGE y SNIS, así como una cartografía que explica las diferenciaciones de acceso a dichos servicios en el Extremo Oeste Metropolitano Fluminense, ejemplificado por el caso de la ciudad de Paracambi.

Palabras clave: Acceso al agua y al saneamiento; Neoliberalismo; Privatización de la CEDAE; Desigualdades.

Introduction: thinking about politics' ecology, socioenvironmental and neoliberalism

In a recent survey, Instituto Trata Brasil¹ (Institute Treat Brazil) revealed something obvious to those who travel the public roads of the cities of Baixada Fluminense (Rio de Janeiro Lowlands): the municipalities that make up this region occupy the worst positions in the national scenario regarding basic sanitation. In the ranking, in which access to basic sanitation is evaluated between 2013 and 2020 in the one hundred largest municipalities in Brazil, Belford Roxo, São João de Meriti, Duque de Caxias, and Nova Iguaçu – in addition to São Gonçalo, located in the east of the city of Rio de Janeiro, but part of its urban sprawl – stand out negatively². Metropolitan peripheries are therefore marked by unequal access to water and sanitation networks. (ROCHA, 2022).

We can think that not only its peripheries are a “great laboratory”, but the structures and processes that run through Rio de Janeiro show general trends of a complex and contradictory Brazil (LESSA, 2001; OLIVEIRA, 2003). Regarding sanitation, this could not be different. It was exactly on April 30, 2021, the day when the history and culture of its periphery is celebrated - Baixada Fluminense (Rio de Janeiro Lowlands),

¹ Civil organization of public interest formed, since 2007, by companies that evaluate the advances in basic sanitation and in the protection of water resources in the country.

² Consult: BAIXADA Fluminense has the worst sanitation rates among the 100 largest municipalities in the country. *Brasil de Fato, Rio de Janeiro* (RJ), March 22, 2022.

that the first auction in Brazil took place derived from the New Sanitation Framework (Novo Marco do Saneamento) (Law 14.026/2020), which culminated in the privatization (concession of water distribution and wastewater collection services) of Companhia Estadual de Água e Esgoto do Rio de Janeiro (CEDAE)³. (State Water and Sewerage Company of Rio de Janeiro).

The referred “new” Legal Framework of July 15, 2020 is considered by many scholars as the neoliberal incorporation of assets linked to the sanitation and water privatization structure (SOUZA,2020; SOUZA; COSTA, 2016). Using a certain technical guise of universalizing drinking water to more than 99% of the population and with the promise of expanding access to sewerage networks to 90% of the country by 2033, in fact it was a strategy to build an environment of legal security and competitiveness to the sector's businesses. In the geographic scope, this new legal framework, in addition to providing the feasibility of granting distribution rights, is based on the possibility of creating "regions" or "territories" of concession, which would be a grouping of areas - which may vary in cities, neighborhoods or even regions – so that they can be taken over by the private sector.

This geographic element is strategic, especially in the spatial differentiation of the supply and wastewater collection systems. While it can cause tensions in the supply and demand of private operators in the sector, it will certainly promote what we can call *processes of exclusion from the political ecology of sanitation*, based on a selectivity of spatial attributes of the area based on the cost-benefit of operations, to the detriment of ensuring rights to sanitation. This becomes evident when we look at the concession of CEDAE

The so-called CEDAE Auction was consolidated as a strategic event in the legitimization of this new legal framework, which was also linked as central in the conduct of Brazilian macroeconomic policies, by taking on a relevant role in the privatization and concession rounds the then Presidential Chief of Staff, Luiz Eduardo Ramos, the then Minister of Economy, Paulo Guedes, whose presence revealed the importance for the realization of other concessions that would arise to Brazil⁴. Such was the importance of this feat that the current Governor of the State of Rio de Janeiro, Claudio Castro (until that date still acting governor in the state government) preferred to participate in the auction rather than witness the impeachment votes of the then incumbent governor, Wilson Witzel, in Fluminense Legislative House.

Aiming to achieve the feasibility of granting an extremely robust technical network structure, there was a division into four (4) blocks, being divided: Block 1, formed by a set of eighteen (18) cities and part of the South Zone of the city of Rio de Janeiro , which was sold for R\$8.2 billion⁵ to Aegea Saneamento; Block – 2, comprising the

³ It is important to highlight that CEDAE will continue to exist, being responsible for collecting water and distributing it to the concessionaires that will take over the new regional blocks. For more details see Julião (2022)

⁴ For more details see Castro (2021)

⁵ 1 USD = 5,3905 BRL 16/11/2022 - US\$ 1.521.194.694,00

municipalities of Miguel Pereira and Paty de Alferes, plus the Rio de Janeiro neighborhoods of Jacarepaguá and Barra da Tijuca, which was acquired for R\$7.29 billion⁶ by Iguá Saneamento S.A.; Block 3, formed by neighborhoods in the West Zone of the city of Rio de Janeiro, especially Santa Cruz and Campo Grande, and the municipalities of Paracambi, Itaguaí, Seropédica (all belonging to the Metropolitan Region), as well as Pinheiral, Rio Claro and Pirafá, which was not sold at the first auction; and Block 4, which brought together neighborhoods in the North Zone of the city of Rio de Janeiro and a significant part of the municipalities of Baixada Fluminense (Rio de Janeiro Lowlands) (Belford Roxo, Duque de Caxias, Japeri, Mesquita, Nilópolis, Nova Iguaçu, Queimados and São João de Meriti), which ended up being acquired for R\$7.2 billion⁷ also by AEGEA.

What drew attention was the fact that Block 3 was not sold at the time, being only purchased after the inclusion of other cities in the state of Rio de Janeiro, forming a block of 22 neighborhoods in the city of Rio de Janeiro and 20 Municipalities⁸. The new auction, held in December 2021, was awarded to the Águas do Brasil group – Rio+Saneamento concessionaire – with the amount of R\$2.2 billion⁹. In a way, the lack of interest on the part of the private sector in the region was based on at least three perspectives: [1] the problematic technical infrastructure, especially in the area of sanitary wastewater, which might have not been profitable; [2] the danger of operation and management in territories marked by militia groups, especially in the West Zone of the city of Rio de Janeiro; [3] the problematic connection of water and wastewater of the residences, with a large part fed by informal networks - the so-called "gatos"(illegal connection to the water supply grid) -, which would indicate circumstantial losses of financial return.

It is also noteworthy that in this former Block 3 there were cities that territorially integrate the so-called Guandu Hydrographic Basin. This region is the water collection of the Guandu system, which is responsible for supplying 9 million inhabitants in the metropolitan region of Rio de Janeiro. These cities have very different social and territorial characteristics. Contrary to a scenario of water scarcity, it is proved, from a critical political ecology view, that the proximity to “water bodies”, ponds, rivers, waterfalls, are not always guarantee the full supply of residents. (LOFTUS, 2021).

The concession of CEDAE services, especially when we look at the metropolitan periphery of Rio de Janeiro, highlights both the problem of metropolitan supply and fairness of distribution and access to water and sewerage networks. Still, there is a need to reflect to what extent CEDAE's privatization actions will be able to account for this totality of both accesses to water and sanitation, especially with the lower income population. (BRITTO, 2015).

That is why it is necessary to look at the metropolitan scale so that we can better interpret the asymmetries that mark its peripheries. In this sense, we will methodologically

⁶ US\$ 1.352.379.185,00

⁷ 1 USD = 5,3905 BRL 16/11/2022 - US\$ 1.335.683.146,00

⁸ We suggest consulting Mourão and Sorima Neto (2021)

⁹ US\$ 408.125.405,00

base ourselves on the interpretations of the work of Alex Loftus (2021), prioritizing the look at the “spatialization and historicization” of access to sanitation networks. Facing this issue theoretically requires a multidisciplinary approach. If Geography plays a salutary role in mobilizing the analysis of space, bringing together the elements of nature and human actions in a single movement, our efforts have focused on Political Ecology, a field of knowledge resulting from the emergence and politicization of the contemporary environmental issue. Whether from the environmental implications of recent industrialization in the metropolitan peripheries of Rio de Janeiro, whether in the forms of collection, distribution, use, pricing, destination and related ecological care in water consumption, Political Ecology has proved to be an analytical force for the critical analysis of the local-regional reality.

In this context, to present the challenges of the political ecology of sanitation from the periphery, we will divide this article into three parts. In the first part, we conduct a theoretical review on the field of political ecology, presenting the possibilities and reading from the point of view of sanitation from a critical perspective. In the second part, we will present the data collected on the peripheral municipalities of the so-called Extremo Oeste Metropolitano (Metropolitan Far West), in which three cities of the titled Block 3 of CEDAE are located. In this part we will present data from IBGE (Brazilian Institute of Geography and Statistics) and SNIS (National Sanitation Information System), as well as a spatial reading of water accesses and sanitary sewerage. The proposal of the third part of the work is to reflect, from the exemplification of the city of Paracambi, on the challenges of a political ecology of sanitation, in particular to effect spatial justice in accessibility amid the current harsh reality and post-privatization situation of CEDAE. In the search for the universal access to water and sanitation, it is necessary to overcome the *processes of exclusion from the political ecology of sanitation, historically so unequal in the region.*

Political ecology and basic sanitation: an analysis effort from the periphery

In our understanding, it is up to Political Ecology to critically interpret (LEFF, 2002 [1998]) the complex relationships between society and nature, in its political, economic, social, technical, and cultural aspects. It is, therefore, a strongly political-economic field, which allows for a detailed critique of business models using the concept of sustainable development and dialogues with the conceptual lexicon of the vilified social groups, made invisible, affected, and directly attacked by violent forms of appropriation of natural resources. Political Ecology is knowledge, it is struggle, action, and dialogue with other forms of knowledge and scientific fields.

Political Ecology focuses range from the conflicts generated by the unequal distribution of ecological resources to the decision-making power over their governance; examines the groups that are directly impacted by pollution while understanding the dominant engineering that underpins the model; it builds alternatives for environmental justice and goes beyond the view that environmental problems are purely technical or cyclical failures (BOELENIS et al., 2015). The central issue, therefore, is power, and its

weave in the management and distribution of natural wealth, which in the current pattern implies diverse and profound environmental injustices (DEL GRANDE, 2016). Conflicts over access, distribution and control over ecological wealth are at the core of field investigations (MARTÍNEZ-ALIER, 2007); and bringing such debates to the universe of geography is essential (WATTS, 2000), especially regarding the peripheral nations of the world (BRYANT, 1992).

With globalization, and its neoliberal and financialized economic mechanics, Political Ecology gains even greater importance: privatization of strategic natural resources, the seizing of common goods and environmental devastation are signs of the present time (ÁVILA-GARCÍA, 2016). According to Patricia Ávila-García (2016), the neoliberalization of nature [and water], especially in Latin America, is based on expropriation, accumulation by dispossession (HARVEY, 2004 [2003]), commodification and privatization of land, converting various forms of community, collective or state property into private property, restricting access to common goods and adopting colonial, neo-colonial and imperial processes of appropriation of natural wealth. The author reinforces the teachings of Eric Swyngedouw (2005), who relates accumulation by dispossession with the neoliberal ideology centered on the virtue of the market as a manager and of the private sector as an operator and service provider in the field of basic sanitation.

In this scenario, Political Ecology offers important interpretive tools on the social and symbolic issues of the environment, the power structures related to the appropriation and use, access and control of water resources, the network of biophysical, sociocultural, and economic processes and the relationships institutions in water management (NYGREN, 2015; SOARES, 2021). The neoliberal scenario makes the market the main beneficiary of the State actions, often in a violent and authoritarian way (HARVEY, 2005 [2008]), especially in the peripheries of the world (OLIVEIRA, 2022); on this horizon, in peripheral areas such as Baixada Fluminense (Rio de Janeiro Lowlands), competition becomes unfair with the central and richest areas of the city of Rio de Janeiro, which catalyzes investments and receives more attention from companies. Water has been consolidated as a valuable commodity and its management in a business way has gradually replaced the notion of “water as a human right” (ROCHA, OLIVEIRA, 2020).

And with the emergence of a corporate-oriented government pattern, which promotes shared management by public-private governance models under managerial formulas, the commodification of state management and the subversion of democracy and citizens' rights occurs (DARDOT, LAVAL, 2016 [2010]). Thus, according to Pierre Dardot and Christian Laval (2016 [2010]), the business vocabulary is adopted by State agents, with the privatization of the construction of norms, the hybridization of public and private actions and the selfishness of the undertaken actions, substituting the collective perspective for the corporate one and the general interests by private interests. The emptying of the planning and management of public affairs gradually transforms rights into services, which are performed in an excluding and segregating way.

It is possible to present the main guiding issues of the Political Ecology of Water, from an interpretation built based on the periphery:

- (i) Political ecology is a field of knowledge of central importance for the critical analysis of contemporary environmental issues. From the perspective of those in the periphery, the debate on the meaning of sustainable development, social-environmental responsibility, environmental compensation, ecological preservation, pollution, and other terms is essential. (OLIVEIRA, 2022);
- (ii) There is a strong relationship between the realization of social and production relations, everyday life, and technologies, among others, with the proposition of a political ecology of water (LOFTUS, 2021). According to Alex Loftus, the debate on water security and insecurity should not be guided by water scarcity or a deterministic technological framework, but by economic, political and social relationships. Water scarcity, which must be relativized and considered as something socially produced from a resource mobilized by human beings on a large scale (BAKKER, 2003);
- (iii) Neoliberalization in social relations (HEYNEM, ROBBINS, 2005; KEIL, 2005) creates profound impacts on nature and, in particular, on access to water and disposal of household waste. The neoliberal state, in its different scales, is a construct usurped by the interests of the market, privatizing territory and nature and building fabrics of restriction or access. It is therefore necessary to make a profound critique of the privatization and commodification of water (COSTA, 2003; RIBEIRO, 2003; BORDALO, 2008);
- (iv) The social organization around watersheds is a fruitful record of the society-nature dialogue, it is a fertile field for interpreting the interactions between political and technical actions (WOLF et al., 2003). In ongoing research, not only it is perceived that a more astute look at the society-nature relationship is necessary, provided by the scale of the watershed, but, increasingly, care and attention must be increasingly expanded regarding social-physical conditions and historical contexts in existing geographic areas for environmental preservation and prevention of various impacts (SWYNGEDOUW, 2009).
- (v) The scenarios of inequalities in access to these services are territorialized (ROCHA, 2021), as this access to water and sewerage takes place through the provision of technical or social-technical infrastructure (QUINTSLR, 2018), through a plumbing network that gives meaning to the supply flows. Flows related to water are also “flows of power” (SWYNGEDOUW, 2004), demarcating the territories of use of these services, differentiating the spaces and the people who can access them.

- (vi) Central issues in the struggle for environmental justice are the concerns with water contamination and water quality recovery processes (PORTO, PORTO, 2017) and the need for adequate procedures to settle environmental conflicts (LEFF, 2002 [1998]). In this sense, the poor conditions of access to basic sanitation and the need to serve several communities located in spaces opaque to the capital proves to be an inescapable scope.

Scenario of access to water and sewerage networks on the periphery of the outskirts of the metropolis: the Metropolitan Far West and Block 3 of the CEDAE concession

The metropolitan space of Rio de Janeiro is extremely complex and the form of production of its periphery was gradually constituted from the urban incorporation induced by circulation networks (SEGADA SOARES, 1962) and by an abrupt transition from rural to urban use in certain locations (GEIGER E SANTOS, 1954). This passage of urban use, marked in the allotments of orchards and farms in the region, was not accompanied by an adequate technical infrastructure, spawning the problems related to sanitation in its periphery, especially in the western portion of this region, known as Baixada Fluminense (Rio de Janeiro Lowlands). (ROCHA, 2014; BRITTO; QUINSTLZR, 2020).

Inspired by the work of Sandra Lencioni (2007), which recovers the classic Marxist concept, we can say that there are general conditions of production that ended up promoting differences in this periphery. The literature on the geography of Rio de Janeiro (ABREU, 2006) highlights classifications that are still relevant, such as the notion of direct periphery, markedly formed by those more troubled municipalities located in the vicinity of the capital, and which were incorporated throughout the 1930s to 1960s into the urban sprawl of the city of Rio de Janeiro. These would be the municipalities of the so-called Nova Iguaçu Lowlands¹⁰. There would still be a kind of “distant periphery”, or what we can still call the “periphery of the periphery”. This portion of the metropolitan region includes municipalities that still have peri-urban characteristics, but which in recent years have experienced a great growth in their urban areas. Furthermore, we cannot ignore the increase in metropolitan interaction and circulation, which leads us to think that this region has also become, in the last decade, a fully integrated part of the direct periphery. We are, in the end, dealing directly with the cities that are in the Far West Metropolitan Area of the city of Rio de Janeiro, namely: Paracambi, Itaguaí, Seropédica, Japeri and Queimados (OLIVEIRA, 2015)

As previously explained, in the sanitation sector, this periphery was fragmented into at least two concession blocks (Block 3 and Block 4), (see figure 1), one of the blocks being responsible for the moment of tension when there was no bid for the private initiative regarding the management of concession services. The cities of Paracambi, Itaguaí and Seropédica are located in the so-called Block 3, which was not acquired in

¹⁰ These are municipalities that today form what we call "Dense Urban Conurbation" (ROCHA et al, 2021), marked by the municipalities of Mesquita, Nilópolis, Belford Roxo, São João de Meriti, Nova Iguaçu and Duque de Caxias.

isolation due to, among other issues, the technical infrastructure conditions that would require a large volume of investments. The municipalities of Japeri and Queimados are linked to Block 4, but despite being part of the same Hydrographic Basin (Guandu Basin), the management of their sanitation services is fragmented. This can boost problems in the management and execution of demands in these municipalities and for the maintenance and sustainability of the Basin.

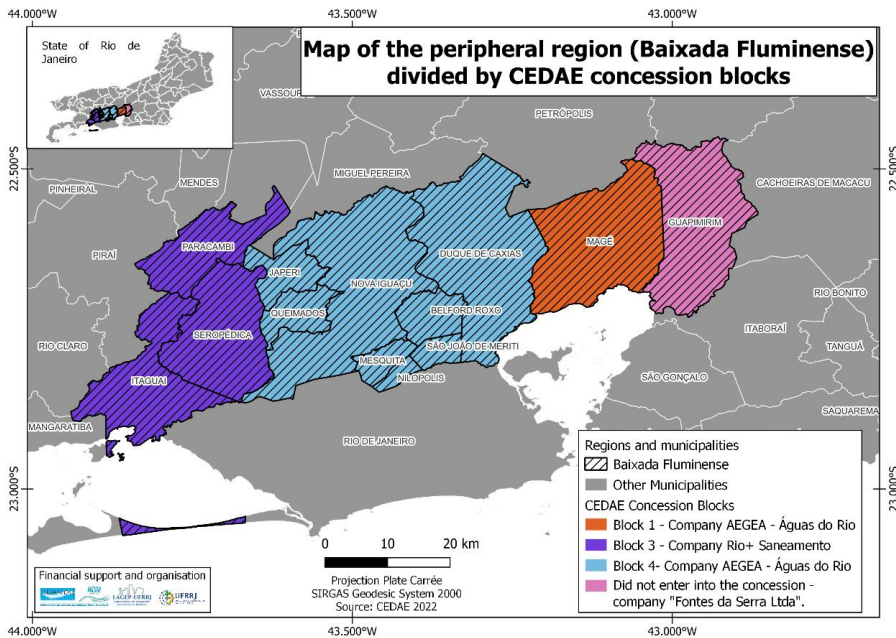


Figure 1: Map of the peripheral region (Baixada Fluminense) divided by the CEDAE concession blocks.

Source: CEDAE,2022. Organization by LAGEP-UFRRJ

In this sense, the municipalities highlighted and fragmented by the different management of the conceptions, show a problem: the reproduction of the political ecology of water paired in the game of “inclusion-exclusion”. This would be materialized in the exclusion/inclusion of concession territories (observed in the gap between the first and second rounds of CEDAE privatization) and in the disharmony of the operation and service goals of these services. Although these municipalities had certain common features regarding the production of these peripheral territories, as well as their insertion in the Guandu Basin, each of the concessions in Blocks 3 and Blocks 4 have different goals for implementation and compliance with current regulations. This scenario alone would generate a regional mismatch in guaranteeing the universal access to sanitation services.

As it is well known, living conditions on the periphery present major problems in accessing basic rights (SANTOS, 2007) and this article reinforces that basic sanitation is part of the wide range of social rights. There is also, from a spatial point of view, a

contradiction posed to the residents of this periphery of the periphery: as they are integrally inserted in the most important hydrographic basin of metropolitan supply (Guandu Hydrographic Basin - RH II), these inhabitants should, at least, have the adequate or superior access to water, or at least equivalent, to inhabitants of the Rio de Janeiro City. This is not what happens, as it can be seen in Figure 2, regarding the index of qualitative access to water and sanitary sewage, based on SNIS data.

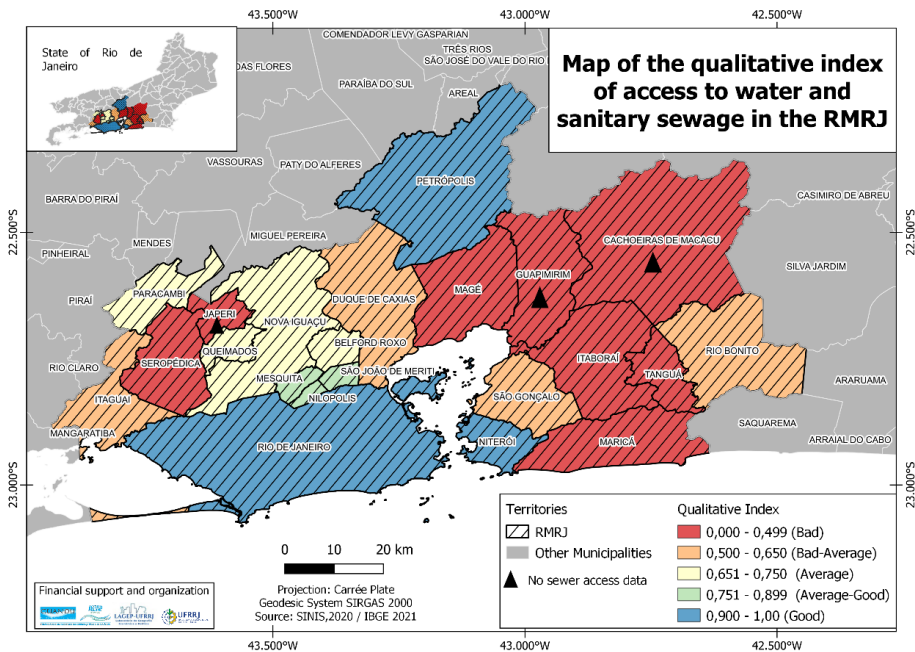


Figure 2: Map of the qualitative index of to water and sanitary sewage in the RMRJ.
 Source: SNIS, 2020/ IBGE 2021. Organization: LAGEP-UFRRJ

We considered the 2020 SNIS data on access to water and sanitary sewage collection for the elaboration of the Quality Index map. Each of the data was divided by the estimated population (IBGE, 2021). To obtain the index, the expression *Access to Water/Estimated Population + Access to Sewage Collection/Estimated Population* was made and then all the lines of the expression were divided by the highest number obtained, so that the best indexes correspond to 1 and the worst to 0. The map shows the territorial asymmetries existing in the metropolitan space, and, as it is possible to observe, the municipalities located in the extreme west (which includes those inserted in the Guandu Basin), as well as in the extreme east of the metropolitan region have mostly bad and bad-regular indicators, being far below the indexes of cities like Rio de Janeiro and Niterói.

Therefore, there is an "unequal hydrosocial cycle" produced in the injustice of access to sanitation (SWYNGEDOUW, 2009). This unequal hydrosocial cycle consists of the persistence of problems in the supply, collection, and treatment of wastewater, and

consequently in the pollution of the waters (lakes, lagoons, rivers, etc.) that supply these same people. This is the great challenge of this region: to promote and expand access to water and sanitation while promoting ecologically sustainable actions for the continuation of the Guandu watershed and water security of the system's supply systems Guandu-Lages¹¹

This challenge stands out, above all, when we think of the final cost to the population in the midst of the promise of universal access to water and sanitation in this region in this post-privatization context of the services formerly provided by CEDAE. Rocha (2022) highlights that the residents of the cities in these regions, such as Itaguaí (R\$8.92¹²) and Seropédica (R\$7.85¹³), pay close to or even double the national average cost (R\$4.25¹⁴) for water and sewerage services. The major concern of researchers specializing in the subject is precisely the discrepancy that these private concessions may have for the supply of poorer populations. Ana Lucia Britto (2015) endorses the need to think about how the “social tariffs” that would guarantee an “equitable” payment of populations with lower purchasing power in the face of the new private concession, since even with the operation of the state company, the costs already were too high for the earnings of the local population. It is very important to think about this cost in the current context of mass impoverishment of the population (Table 1), in which a large part of the inhabitants has an income of less than half the national minimum wage, as well as a historical rise in the costs of these tariffs in recent years, as can be seen in graph 1.

Municipality	% of the population with average income of up to 1/2 minimum wage.
Itaguaí	37,1 %
Japeri	41,4 %
Paracambi	36,8 %
Queimados	39,1 %
Seropédica	37,4 %

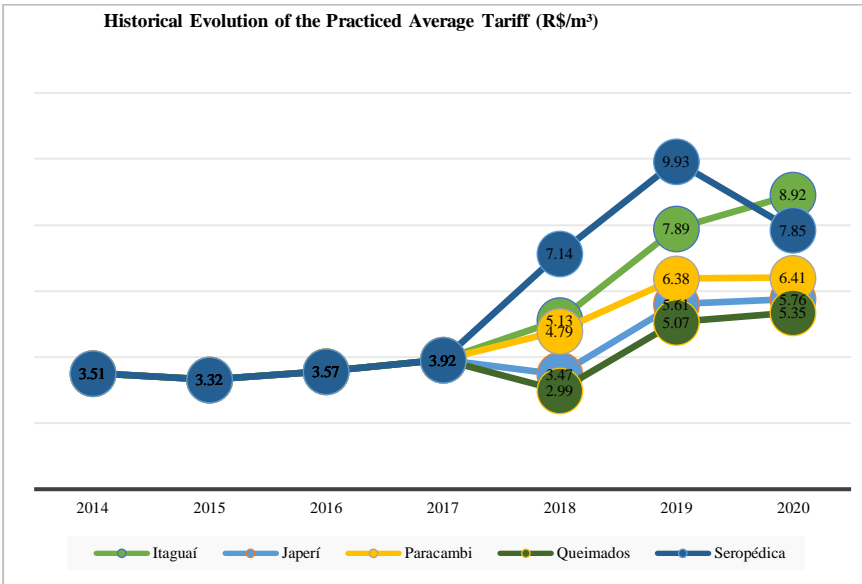
Table 1: Percentage of Population with income up half the minimum wage in 2010
Organization: LAGEP-UFRRJ. Source: IBGE – Cities

¹¹ The Guandu and Lajes Systems are distinct systems that overlap and unify in certain parts of the city of Rio de Janeiro. According to INEA, the Lajes System dates back to the beginning of the 20th century, due to the use of the dam at the Lajes reservoir (municipality of Paracambi), which began operating in 1940, with the construction of its first pipeline. The system was later expanded to enhance the supply of the capital. The Guandu System was also systematized in the 1950s, according to INEA, and is associated with the creation of the WTS (Water Treatment Station) Guandu, consisting of two treatment stations, the first being inaugurated in 1955 and the second in 1982. This system benefits from the transposition of the waters of Paraíba do Sul that increase the flow of the Guandu River, being responsible for supplying more than 9 million people today.

¹² 1 USD = 5,3905 BRL 16/11/2022 - US\$ 1,65

¹³ US\$ 1,46

¹⁴ US\$ 0,79



Graph 1: Historical evolution of water and wastewater services tariffs.
Organization: LAGEP-UFRRJ. Source: SNIS –Historical Series.

The data from the historical series of the National Sanitation Information System shows the increase in tariffs in these peripheral municipalities, the values of which, in three of them, are higher than the national average. This is an average tariff, since the amounts charged by the Rio+Sanseamento concessionaire can be much higher, as shown in the figure below.

TARIFA REFERENCIAL DE ÁGUA (TRA): R\$ 3,8320			
CATEGORIA	FAIXA	ÁGUA (R\$/m³)	ESGOTO (R\$/m³)*
DOMICILIAR	(CONTA MÍNIMA)	3,8320	3,8320
	De 0 até 15 m³	4,3900	4,3900
	De 16 até 30 m³	9,6580	9,6580
	De 31 até 45 m³	13,1700	13,1700
	De 46 até 60 m³	26,3399	26,3399
	Acima de 60 m³	35,1199	35,1199

Figure 3: Rio+Sanseamento (2022) Tariff References for Households
 Source: Rio+Sanseamento

According to the UN, the consumption of 110 liters of water per day is considered the amount necessary to meet basic health and hygiene conditions, which is equivalent to 3.3 m³ per month. The average Brazilian consumption is equivalent to 200 liters per day,

something close to 6m^3 per month¹⁵. If we consider the basic consumption indicated by the UN of 3.3m^3 throughout the month per person, the “consumer in this region will pay the fee of R\$4.39¹⁶/ m^3 . Thus, a residence with 4 people would pay the equivalent of R\$57.94¹⁷, equivalent to 4.7% of the national minimum wage. On the other hand, if we consider the average consumption in Brazil of 6m^3 for a residence, with 4 people, consumption would be equivalent to 24m^3 per month, which would lead the resident of the region served by the Rio+Saneamento concessionaire to pay R\$9.65¹⁸ / m^3 , in a monthly account close to R\$ 231.6¹⁹, equivalent to almost 20% of the national minimum wage (R\$ 1,212.00²⁰). Just bear in mind the information contained in Table 1, which informs that more than 37% of the population of these municipalities has an average income of less than 1/2 minimum wage (something close to R\$606.00²¹), so that the cost of the water and sewerage tariff will become unfeasible for a large part of the population. Another indicator is clearly defined: the greater the consumption, the greater the rate applied, marking the trend of water valuation and commodification. (SWYNGEDOUW, 2009).

Therefore, the critical interpretation of the processes of privatization of services and commercialization of water, according to the work of different authors (COSTA, 2003; RIBEIRO, 2003; BORDALO, 2008), leverage existing asymmetries that underpin unfair and unequal political water ecologies (LOFTUS, 2021). In practice, such asymmetries materialize global verticalities while creating schizophrenia in the territories (SANTOS, 2007), producing local facets of a perverse globalization that deepens and perpetuates differences in access to water, as seen in these municipalities in the Far West side of Metropolitan Region around the city of Rio de Janeiro.

It is important to remember that the fact of living close to the most important water supply basin in Rio de Janeiro does not guarantee access to water for these populations. For example, the fact that explaining the situation of the municipalities in this region can be evidenced through the case of Paracambi, which despite having in its territory the passage of supply networks linked to the Lages system (based on collection in Ribeirão das Lajes), has different neighborhoods that do not have adequate access to water and wastewater collection.

The Ribeirão das Lajes is an important watercourse that cuts through important municipalities in Rio de Janeiro. Its waters feed the Ribeirão das Lajes Complex, historically responsible for the production and distribution of energy generated by hydroelectric plants in the state of Rio de Janeiro. From the construction of the dam and the Fontes plant, in 1908, which effectively started the generation of large hydroelectric energy in the state, to the expansion of the lake, which was accompanied by the construction of new hydroelectric plants, such as Nilo Peçanha, Fontes Nova (the older

¹⁵ For more information consult SABESP (2022).

¹⁶ 1 USD = 5,3905 BRL 16/11/2022 – US\$ 0,81

¹⁷ US\$ 10,75

¹⁸ US\$ 1,79

¹⁹ US\$ 42,96

²⁰ US\$ 224,84

²¹ 1 USD = 5,3905 BRL 16/11/2022 – US\$ 112,42

was to be called Fontes Velha and would be deactivated) and Pereira Passos, the watercourse of Ribeirão das Lajes ends its path being renamed, from the limit between Japeri and Paracambi, of Rio Guandu (OLIVEIRA, F., 2013; 2013a ; OLIVEIRA, L, 2020). In 2011, a Small Hydroelectric Power Plant came into operation downstream of the Pereira Passos Hydroelectric Power Plant, which discharges its water into Ribeirão das Lajes, in the municipality of Paracambi, with a rated power of 25 MW.

Not only is the Ribeirão das Lajes Complex directly responsible to produce electricity in Rio de Janeiro, but also for the supply of drinking water to 1.8 million inhabitants in the municipalities of Itaguaí, Japeri, Nova Iguaçu, Paracambi, Queimados and part of the municipality of Rio de Janeiro. The Lajes Reservoir, which supplies the homonymous Treatment Unit, receives water from the Pirafé, Pires, Prata and Machado rivers, and is part of the Guandu River Basin, having 338,8 km².

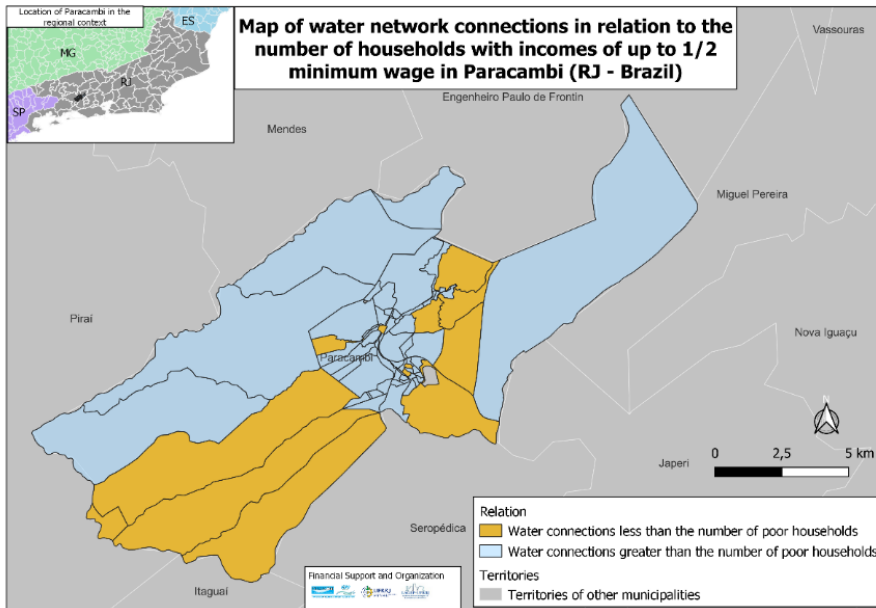


Figure 4: map of network connections in relations to the number of households with incomes of up ½ minimum wage in Paracambi (RJ- Brazil)
Organization: LAGEP-UFRJ. Source: CENSO IBGE,2010.

The appropriation of water in Paracambi historically enabled the general conditions of production (LENCIONI, 2007) of the city and the industrialization of the municipality, when the fabric factory was installed in the 19th century. However, the universalization of access to water and sewerage networks was not reflected, as these indirect networks linked to production were relegated to a background in its implementation process. In this way, observing internal asymmetries, as a methodology proposed by Alex Loftus (2021) to historicize and spatialize injustices in access to water,

allows us to understand why, even close to portions of water and liquid bodies, networks are not universalized. Also considering the unequal production of space (HARVEY, 2006), we will realize that this production is directly associated with satisfactory access to water and sewerage, as shown in Figures 4 and 5.

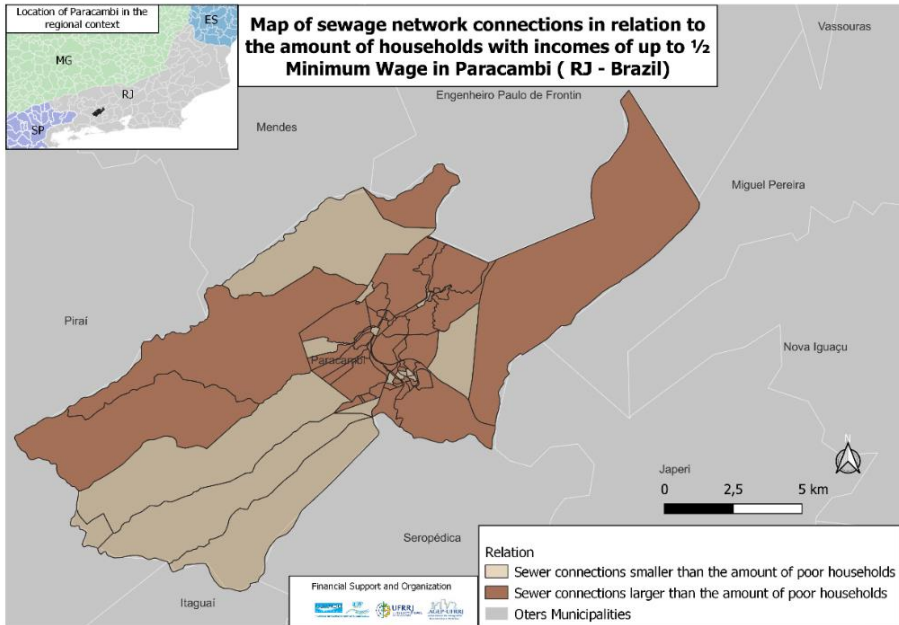


Figure 5: map of sewage network connections in relations to the number of households with incomes of up to 1/2 minimum wage in Paracambi (RJ- Brazil)
Organization: LAGEP-UFRRJ. Source: CENSO IBGE,2010

The maps above show the distribution of access to water and sewerage networks in Paracambi, in relation to the most impoverished households (those earning up to 1/5 minimum wage). The map presents an overview of the municipality by census sectors, based on information provided in the 2010 IBGE Census. It highlights the locations with the lowest purchasing power, where the proportion of poor households is higher and there are fewer water connections and sewerage networks. It also reinforces the peri-urban transition spaces and those further away from the central areas (urban center and close to the historic Companhia Têxtil Brasil Industrial) as areas with a lower occurrence of connections from such networks.

The ineffectiveness that aggravates the asymmetries in access to water and sewerage in this municipality can be easily related to the regional context, encompassing neighboring municipalities. The problem is therefore broader and has direct environmental impacts on the watershed in which these cities are located. There are great challenges for

the privatized management of such services, whose nature is at the root excluding and segregating. After all, in a scenario of water as a commodity, *how to overcome such unequal historical cycles in these peripheral territories of so many injustices in the field of sanitation?*

Final considerations

The scenario that sets the tone for policies and services deliberately takes on a neoliberal feature. We can say that the privatization of CEDAE is a herald of movements for the entire sanitation sector through the new Brazilian legal framework, because it grants the private initiative the broad and massive management of a sector that was predominantly taken over by state-owned utilities and public concessions. The profit of R\$ 22.6 billion²² acquired in the first round alone served as an alibi to sustain the beneficial effect of this process.

What must be questioned is what will the social, environmental, and political costs be despite this initial gain provided by the auction. In the same way, how such expenditure could affect the supply of water and sewerage networks in the metropolitan periphery of Rio de Janeiro?

As we have insistently pointed out, Rio de Janeiro and its periphery have become a true political, economic, social and environmental laboratory for Brazil itself. While the “success” of privatization/concession of CEDAE services is sustained, the non-immediate acquisition of the peripheral territories of the city of Rio de Janeiro and the municipalities of the Far West Metropolitan Area, of the so-called Block 3, serves as a good thermometer of the exclusion processes of the political ecology of sanitation”, by promoting a game of inclusion and exclusion of territories, which were at the mercy of market interests to the detriment of urgent demands and necessary social guarantees in the field of sanitation.

In fact, how to think about the territorial specificities of such an asymmetrical periphery? The Baixada Fluminense (Rio de Janeiro Lowlands) and the metropolitan municipalities that are part of the Guandu Basin help us to look at the plots and textures of the current sanitation framework, forcing us to think about the historical overcoming of the problems in the accessibility of these services. In addition, such asymmetries oblige us to be careful in the face of the commodification and privatization of the sector, which has the potential to make universal access unfeasible, especially for the most impoverished populations, given the high cost of rising average water and sewerage tariffs. absurdly in the region. Thus, what guarantees will such peripheral populations have? What will be the commitments established with such territories?

Once again, geography proves to be paramount in the ability to analyze asymmetries, as they are materialized in the plots of the territory. A territory that is embodied by subjects, who “are precariously included” reveal the hardships of the environmental and social injustices of living on the periphery.

22 1 USD = 5,3905 BRL 16/11/2022 – US\$ 4.192.560.986

As evidenced in the maps and graphs presented, there is a sharp distinction in this access to water and sewerage networks in these peripheries of Rio de Janeiro, and which are still reflected in the existing internal asymmetries regarding the income profile in each city, as it was possible to identify from the example of the city of Paracambi. Therefore, it is important to reinforce the perspective of critical political ecology (LOFTUS, 2021), as well as the spatial processes that produce and reproduce the differences of this singular, unfair and authoritarian neoliberal model of sanitation.

References

ABREU, M. A. *Evolução Urbana do Rio de Janeiro*. 4ªed. Rio de Janeiro: IPP, 2006.

AGOSTINHO, Zilmar Luiz dos Reis. A estação ferroviária de Paracambi: mudanças e permanências econômicas no Extremo Oeste Metropolitano Fluminense. *Espaço e Economia: Revista Brasileira de Geografia Econômica*, Ano 9, número 19, 2013. Available at : <http://journals.openedition.org/espacoeconomia/16738>. Access on Apr. 14, 2022.

ÁVILA-GARCÍA, Patricia. Rumo a uma ecologia política da água na América Latina. *Revista de Estudios Sociales* [On line], 55, Janeiro de 2016. Available at: <http://journals.openedition.org/revestudsoc/9602>. Access on sept. 29, 2022.

BAKKER, K. J. A Political Ecology of Water Privatization. *Studies in Political Economy*, 2003, 70 (1): 35-58.

BOELENS, R., DAMONTE, G., SEEMANN, M., DUARTE, B., & YACOB, C. Despojo del agua en Latinoamérica: introducción a la ecología política del agua en los agronegocios, la minería y las hidroeléctricas. In: YACOB, C.; DUARTE, B.; BOELENS, R. (Eds.). *Agua y Ecología Política: El extractivismo en la agroexportación, la minería y las hidroeléctricas em Latinoamérica*. Quito: Justiça da Água; Edições Abya-Yala, 2015, pp. 11-29.

BORDALO, C. A. L. A gestão dos recursos hídricos a luz da ecologia política. Um debate sobre o controle público versus o controle. *Cuadernos de Geografía – Revista Colombiana de Geografía*, 2008, 17: 117-125.

BAIXADA Fluminense has the worst sanitation rates among the 100 largest municipalities in the country. *Brasil de Fato, Rio de Janeiro* (RJ), March 22, 2022. Available at: <https://www.brasildefato.com.br/2022/03/22/baixada-fluminense-tem-os-piores-indices-de-saneamento-entre-os-100-maiores-municipios-do-pais>. Access on: Sept. 29, 2022.

BRITTO, A L. Tarifas sociais e justiça social no acesso aos serviços de abastecimento de água e esgotamento sanitário no brasil. In: Castro, E.J.; Heller, L.Morais, M.P (ed.'s). *O direito à água como política pública na América Latina: uma exploração teórica e empírica*. Brasília: IPEA, pp.209-226., 2015

BRITTO, A L; Quintslr, S. Políticas e programas para esgotamento sanitário na metrópole do Rio de Janeiro: um olhar na perspectiva das desigualdades ambientais. *Cad. Metrop.*, São Paulo , v. 22, n. 48, p. 435-456, 2020 Available at:

http://www.scielo.br/scielo.php?script=sci_arttext&pid=S22369962020000200435&lng=en&nrm=iso. Access on sept.15, 2021

BRYANT, Raymond. Political ecology: An emerging research agenda in Third-World studies. *Political Geography*, 11-1, Jan. 1992, pp. 12-36.

CASTRO, Carolina Oliveira. Cedaé é leiloada por R\$ 22,7 bi, em vitória dos governos federal e estadual. *Uol*, 30 de abril. 2021. Available at: <https://economia.uol.com.br/noticias/redacao/2021/04/30/em-vitoria-politica-do-governo-federal-e-estadual-ceda-e-leiloada-em-sp.htm> . Access on de sept. 30, 2022.

COMPANHIA ESTADUAL DE ÁGUAS E ESGOTOS DO RIO DE JANEIRO (CEDAE). Sistema Ribeirão das Lajes. Available at: <https://cedae.com.br/sistamaribeiraodaslajes#>. Access on aug 25, 2022

COSTA, W. M. Valorizar a água da Amazônia. Uma estratégia de inserção nacional e internacional. In: ARAGÓN, L.; CLUSENER-GODT, M. (Coords.). *Problemática do uso local e global da água da Amazônia* Belém: NAEA/UFPA/UNESCO, 2003, pp. 299-320.

DARDOT, Pierre; LAVAL Christian. **A nova razão do mundo**: ensaio sobre a sociedade neoliberal. São Paulo: Boitempo, 2016 [2010].

DEL GRANDE, Maria Helena. **Distribuição e acesso à água em Campina Grande**: Uma análise a partir da Ecologia Política. Tese (Doutorado em Recursos Naturais) – Universidade Federal de Campina Grande, Centro de Tecnologia e Recursos Naturais, 2016.

FURTADO, Cristiane Silva. A Gigante Brasil Industrial: herança e modernidade no Vale Paraíba Fluminense – a Fábrica Paracambi na segunda metade do século XIX. *Espaço e Economia*: Revista Brasileira de Geografia Econômica, Ano 6, número 12, Janeiro / Junho de 2018. Available at: <http://journals.openedition.org/espacoeconomia/3175>. Access de set 29, 2022.

GEIGER, P P. & SANTOS, R L. “Notas sobre a evolução da ocupação humana na Baixada Fluminense”. In: *Revista Brasileira de Geografia*. Ano XVI, n.º 03, julho- setembro de 1954. pp.291-313.

HARVEY, David. *O Novo Imperialismo*. São Paulo, Edições Loyola, 2004 [2003].

HARVEY, D. *A produção capitalista do espaço*. São Paulo: Anablume, 2006.

HARVEY, David. *O Neoliberalismo*: História e Implicações. São Paulo, Edições Loyola, 2008 [2005].

HEYNEN, N.; ROBBINS, P. The Neoliberalization of Nature: Governance, Privatization, Enclosure and Valuation. *Capitalism, Nature, Socialism*, 2005, 16 (1):5-8.

JULIÃO, Fabricio. Novo Marco Legal do Saneamento já gerou mais de R\$ 70 bilhões em investimentos. *CNN Brasil*. Available at: <https://www.cnnbrasil.com.br/business/novo-marco-legal-do-saneamento-ja-gerou-mais-de-r-70-bilhoes-em-investimentos/> . Access on sept. 30, 2022

KEIL, R. Progress Report: Urban Political Ecology. *Urban Geography*, 2005, 26 (7): 640-651.

LEFF, Enrique. *Saber ambiental: sustentabilidade, racionalidade, complexidade, poder*. Petrópolis, Vozes, 2002 [1998].

LENCIONI, S. Condições gerais de produção: um conceito a ser recuperado para a compreensão das desigualdades de desenvolvimento regional. *Scripta Nova*. Vol.XI, n245, 2017. Available a: <http://www.ub.edu/geocrit/sn/sn-24507.htm>>. Acess. 20 abril.2020.

LESSA, C. *Rio de Todos os Brasis*. Uma reflexão em busca da auto-estima. Rio de Janeiro: Record, 2001.

LOFTUS, Alex John. (In) segurança hídrica: Garantindo O Direito à água. *GEOSP: Espaço E Tempo* (Online), 25 (2):e-182666., 2021. Available at: <https://doi.org/10.11606/issn.2179-0892.geosp.2021.182666>. Access on sept 29, 2022.

MARTINEZ-ALIER, Joan. *O ecologismo dos pobres: conflitos ambientais e linguagem de valoração*. São Paulo: Contexto, 2007.

MOURÃO, Giovanni; SORIMA NETO, João. Águas do Brasil vence o leilão do bloco 3 da Cedae com lance de R\$ 2,2 bilhões. *Extra*, 29 dez. 2021. Available at: <https://extra.globo.com/noticias/rio/aguas-do-brasil-vence-leilao-do-bloco-3-da-cedae-com-lance-de-22-bilhoes-rv1-1-25335180.html> . Access on sept., 30, 2021

NYGREN, A. Prólogo: Ecología política. Análisis contextualizado del medio ambiente y la sociedad. In: DURAND, L.; FIGUEROA, F.; GUZMÁN, M. (Eds.). *La naturaleza en contexto*. Hacia una ecología política mexicana. UNAM, CRIM, El Colegio de San Luis, 2015.

OLIVEIRA, Francisco. *Crítica à Razão dualista: O ornitorrinco Brasileiro*. Rio de Janeiro: Boitempo, 2003.

OLIVEIRA, Floriano J. Godinho. Eletrificação e formação do patrimônio territorial da Light na cidade do Rio de Janeiro e no Médio Vale do Paraíba. *Espaço e Economia: Revista Brasileira de Geografia Econômica*, Ano 2, número 3, Julho / Dezembro de 2013. Available at : <http://journals.openedition.org/espacoeconomia/497>. Access on April, 14, 2022.

OLIVEIRA, Floriano José Godinho de. Redes técnicas y urbanización: la influencia de la Light and Power en el desarrollo urbano e industrial de Río de Janeiro. In: CAPEL, Horacio; CASALS, Vicente (Org.). *Capitalismo e historia de la electrificación, 1890-1930*. Barcelona, Espanha: Ediciones del Serbal, 2013a, v. I, p. 125-141.

OLIVEIRA, Leandro Dias de. A emersão da região logístico-industrial do Extremo Oeste Metropolitano fluminense: reflexões sobre o processo contemporâneo de reestruturação territorial-produtiva. *Espaço e Economia: Revista Brasileira de Geografia Econômica*, Ano IV, número 7, Jul-Dez de 2015. Available at: <http://journals.openedition.org/espacoeconomia/1814>. Access on oct, 28, 2022.

OLIVEIRA, Leandro Dias de. Geografia econômica, meio ambiente e a luta pela vida. *Espaço e Economia: Revista Brasileira de Geografia Econômica*, Ano XI, número 23, Jan-Jun de 2022. Available at: <http://journals.openedition.org/espacoeconomia/22014>. Access on 29 de set. 2022.

OLIVEIRA, Leandro Dias de. A Reestruturação Territorial-Produtiva da Paracambi-RJ: Um estudo partir da produção de energia por uma Pequena Central Hidrelétrica. In: ROCHA, André Santos da. (Org.). *Baixada Fluminense: estudos contemporâneos e (re)descobertas histórico-geográficas*. 1ed. Duque de Caxias: ASAMIH - Associação dos Amigos do Instituto Histórico de Duque de Caxias, 2020, v. 1, p. 92-106.

PORTO, M.F.S.; PORTO, P.S.S. Ecologia política da água. Conflitos ambientais no Brasil e defesa dos comuns. In: JACOBI, P.; FRACALANZA, A.P.; EMPINOTTI, V. (Orgs.). *Governança da água no contexto da escassez hídrica*. São Paulo: IEE-USP, UFABC – GovAmb, 2017, pp. 114-146.

QUINTSLR, Suyá. *A (re)produção da desigualdade ambiental na metrópole: conflito pela água, 'crise hídrica' e macrossistema de abastecimento no Rio de Janeiro*. Tese (Doutorado em Planejamento Urbano e Regional) – Instituto de Pesquisa e Planejamento Urbano e Regional, Universidade Federal do Rio de Janeiro, Rio de Janeiro, 2018.

RIBEIRO, Wagner Costa. Água doce. Conflitos e segurança ambiental. In: MARTINS, R. C.; VALENCIO, N. F. *Uso e gestão dos recursos hídricos no Brasil*. Desafios teóricos e políticos-institucionais. São Carlos: Editorial Rima, 2003, pp. 71-77.

RIO+SANEAMENTO. Estrutura Tarifária. Available at <https://www.riomaissaneamento.com.br/agencia-virtual/estrutura-tarifaria/>. Access on, sep. 30, 2022.

ROCHA, André Santos da. Desigualdades territoriais no acesso à água e esgoto nas periferias da metrópole: o caso da Baixada Fluminense na Bacia Do Guandu – RJ. *Geografares* [Online], 34, 2022. Available at : <http://journals.openedition.org/geografares/4259>. Access on set.29, 2022.

ROCHA, André Santos da. Projetos e Intervenções de Saneamento na Baixada Fluminense do Século XIX e Início do XX. *Continentes*. n. 5, p. 76-92, jul. 2014 ISSN 2317-8825. Available at: <<http://revistacontinentes.com.br/index.php/continentes/article/view/53>>. Acesso on jun. 20, 2022

ROCHA, André Santos da; OLIVEIRA, Leandro Dias de. Para uma ecologia política da água: análise da periferia metropolitana do Rio de Janeiro (Brasil). *Geography Notebooks*, v. 3, n. 2, p. 111-125, nov. 2020. Available at: <https://www.ledonline.it/index.php/Geography-Notebooks/article/view/2129/1364>. Acesso em: Sept, 29, 2022.

SANTOS, Milton. *O espaço do Cidadão*. São Paulo: Edusp, 2007.

SABESP. 2022. Available at: <https://site.sabesp.com.br/site/interna/Default.aspx?secaoId=595#:~:text=De%20acordo%20c>

om%20a%20Organiza%C3%A7%C3%A3o,mais%20de%20200%20litros%20Fdia. Acces on Sept. 30, 2022

SOARES, M. T.S. “Nova Iguaçu: absorção de uma célula urbana pelo Grande Rio de Janeiro. *Revista Brasileira de Geografia*. Rio de Janeiro: IBGE, vol2, n24, 1962.

SOARES, D. (2021). Ecología política y gestión del agua en territorios rurales. *Regions and Cohesion*, 11(3), 2021, 80-101. Available at:

<https://www.berghahnjournals.com/view/journals/regions-and-cohesion/11/3/reco110306.xml>. Acesso em: 29 de setembro de 2022.

SOUSA, A. C.; COSTA, N. Política de saneamento básico no Brasil: discussão de uma trajetória. *História, Ciências, Saúde – Manguinhos*, Rio de Janeiro, v. 23, n. 3, p. 615-634, jul./set. 2016. Available at: <https://books.scielo.org/id/tn4y9/pdf/castro-9788578794866.pdf>. Access on: sept. 15, 2022

SOUSA, Ana Cristina Augusto de. O que esperar do novo marco do saneamento?. *Cadernos de Saúde Pública [online]*. 2020, v. 36, n. 12. Available at: <<https://doi.org/10.1590/0102-311X00224020>>. Access on sept. 15, 2022

SOUZA, Gabriela Gomes Rodrigues de. A indústria têxtil na crise do Império: o caso da Companhia Têxtil Brasil Industrial. In: *XVII Encontro Regional de História da Anpuh-Rio*, Nova Iguaçu, p.1-8, 2016.

SISTEMA NACIONAL DE INFORMAÇÕES SOBRE SANEAMENTO. Série Histórica. Available at : <http://app4.mdr.gov.br/serieHistorica/> . Access on sept. 15, 2022.

SWYNGEDOUW, Erik. Desapropriando H₂O: o terreno contestado da privatização da água. *Capitalism, Nature, Socialism*, 2005, 16:1, 81-9.

SWYNGEDOUW, Erik. The Political Economy and Political Ecology of the Hydro-Social Cycle. *Journal of Contemporary Water Research & Education*, 2009, 142 (1): 56-60.

SWYNGEDOUW, Erik. *Social power and the urbanization of water: flows of power*: Oxford University Press, Oxford, 2004.

TRATA BRASIL. Available at: <https://tratabrasil.org.br/>. Access on jul.15, 2022.

WATTS, Michael. Political Ecology. In Sheppard, E. and T. Barnes (eds.), *A Companion to Economic Geography*. Oxford: Blackwell, 2000.

WOLF, A.T.; YOFFE, S.B.; GIORDANO, M. International Waters: Identifying Basins at Risk. *Water Policy*, 2003, 5: 29-60.

Acknowledgments

We thank AGEVAP for funding the Research through public notice 16/2019, which enabled the progress of activities, translation and publication of the results and reflections presented above. We also thank the Dean of Research and Graduate Studies at UFRRJ and the CNPq (National Research Council) and FAPERJ (Fundação de Amparo a Pesquisa do Estado do Rio de Janeiro) for funding the IC (Scientific Initiation) Scholarships awarded within the scope of this project. We are also grateful for the support to CAPES, in the form of the Postgraduate Program in Public Policy (PPFH) at the Universidade do Estado do Rio de Janeiro, for the reception and support in the progress of the postdoctoral research. ongoing research, such as: “Political ecology, territorial-productive restructuring and sustainable development in the metropolitan periphery of Rio de Janeiro (Brazil)”, awarded with a Research Productivity Grant (PQ-2) from CNPq to Leandro Dia de Oliveira and that also receives assistance in the form of a grant from the Institutional Program for Scientific Initiation Grants, from the National Council for Scientific and Technological Development (PIBIC-CNPq), as well as being part of the research “Political ecology of peripheral industrialization”, linked to the International Political Ecology Network (POLLEN). We thank the funding agencies for supporting our research.

André Santos da Rocha.

Doctor in Geography from UFRJ and Post-Doctorate in Public Policies and Human Education at PPFH-UERJ. Associate Professor I of the Department of Geography at UFRRJ. He is currently a permanent professor and works at the Vice-coordinator of the Graduate Program in Geography (PPGCEO-UFRRJ).

Km 07, UFRRJ, BR-465, Seropédica - RJ, 23890-000. Prédio da Geociência. Sala 7

Email: asrgeo@gmail.com/ asrgeo@ufrj.br Orcid: <http://orcid.org/0000-0003-0547-5550>

Leandro Dias de Oliveira

Doctor in Geography from UNICAMP and Post-Doctor in Public Policies and Human Training from UERJ. Associate Professor II of the Department of Geography and permanent staff of the Graduate Program in Geography (PPGCEO) and Interdisciplinary Program in Digital Humanities (PPGIHD) at the Federal Rural University of Rio de Janeiro (UFRRJ). Graduated at UFRRJ. Research Productivity Scholarship from CNPq, Level 2. Personal page: r1.ufrj.br/geografiaeconomica.

Km 07, UFRRJ, BR-465, Seropédica - RJ, 23890-000. Prédio da Geociência. Sala 7

E-mail: leandrodias@ufrj.br. Orcid: <https://orcid.org/0000-0001-7257-0545>.

Received for publication December 2022.
Approved for publication January 2023.