

Residual infrastructures: colonialisms in waste management and *catador* politics

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THIS TEXT reflects on the relationship between waste and cities and adopts the spaces of garbage dumps and waste landfills, which are normally stigmatized or made invisible, as a privileged focus of analysis for thinking about production of the city. Waste management systems, centered on garbage dumps, landfills and other locations to dispose of discardable objects, produce specific territories, composing urban infrastructures that remodel the city from its margins.

Considering the case of the closing of a landfill in Jardim Gramacho, in the Rio de Janeiro metropolitan region, we address a process of infrastructural change or the undoing of an infrastructure. The ethnography corresponded to the fieldwork conducted for my doctoral research, when I accompanied the activities of *catadores*¹ of recyclable materials from April 2011 to June 2012.²

The notion of “residual infrastructures” is developed to be a conceptual key to the analysis and its use is justified not only by the theme, because its object is the urban infrastructure dedicated to waste management systems, but above all by theoretically advancing treatment of the issue in relation to three main aspects.

First, by framing in a single analytical perspective the multiple scales, relations, spatialities and temporalities agencied by³ waste, the notion displays its usefulness for focusing on the *residual* dimension, which is not dominant or hegemonic, which constitutes management systems that historically have been conceived through a merely technical perspective used by engineering fields (Reno, 2015). The concept aims to cast light on the “embodied” (Csordas, 1990) and “vital” (Fredericks, 2018) human dimension of “socio-technical” systems (Latour, 1994; Callon, 2004) that compose the infrastructures in question, bringing to the discussion aspects such as body, race and colonialism when considering production of the city.

Second, developing an embodied perspective of infrastructure, which frames materiality, body, race, and power dimensions that historically organize urban development and the formation of cities, the concept provides a processual prisma of urban infrastructures. This allows incorporating a longer duration to the analysis, mapping continuities and discontinuities and the degree to which

changes actualize forms of reproduction or represent conditions of possibility for effective social and urban transformations.

Third, the concept of residual infrastructures proposes an approach that considers the idea of margin, which qualifies it analytically without essentializing and objectifying the geographic and power relations that shape urban space and its dynamics. Here, the margin is understood as a residual position, emphasizing the connection, interdependence and reversibility by addressing relations between supposed margins and centers. This shift incorporates the possibility of a reversal in the perspective of the positions, which constructs a conceptual opening so that the marginal position can be treated with centrality, in a reversible encompassing that reveals the more opaque relations that are systematically left in the shadows.⁴

These characteristics make the concept of residual infrastructures integrative, by not remaining limited to formal or institutional frontiers, incorporating in their scope relations and articulations between different waste management systems beyond the division between formal and informal, assuming as part of a single infrastructure broader spaces of the city, intermunicipal regions and other connections that operate in practice, although are not considered in relation because they are separated on the discursive plane.

Although they are central to the operation and functioning of the waste management systems, the people and bodies that “informally” support these systems and place them in movement are conceived as foreign elements, suffering repeated and ineffective attempts to expel or exclude them. The political effects of this process are materialized in the structural (re)production of social and racial inequalities forged in the colonial context, which continue to shape urban geographies and forms of inhabiting the city by peripheral populations, in particular the *catadores*, who are predominantly black people.⁵

As eminently mediating objects that are in flux, which agency modes of governing, expert and lay knowledge, technical and symbolic systems, material networks and broad markets, the waste and infrastructures that sustain them, and are sustained by them, are considered as “political matters” (Braun et al., 2010; Cirelli, 2021; Mcfarlane, 2008). These matters are permeated, in their most latent facet, by asymmetrical and often unjust power maneuvers, which reproduce racialized structures of inequality. The waste politics in play in the conformation of the infrastructures maintains, however, an open character, carrying in its gaps the possibility for transformation through the daily political action of the actors.

Through ethnographic scenes, this text retraces the history of the Metropolitan Landfill of Jardim Gramacho and analyzes its “closing”, which directly affected the neighborhood and the population of *catadores* who worked there, as a privileged case or infrastructural event (Carse, 2017). This event, which marks the undoing of an infrastructure, conjugates different temporalities, in-

terconnections, and invisibilities, highlighting the distinct power relations and disputes among actors, logics, and administrative models, which constitute the waste politics. This interplay placed in tension not only ways of life and different uses of urban space, but modes of government and models of citizenship that encompassed alternative projects for cities.

Thus, the case converges with global trends towards waste governance, pointing to similarities, but containing significant specificities that allow comparatively considering processes of urbanization, reproduction of inequalities and potentialities of political struggle of the urban poor in the global South.

“Our times of slavery”: people as embodied infrastructures and colonialisms in socio-technical waste systems

Walking on the red earth ground of the landfill, a group of *catadores* is seen seated after a morning of work on the Rampa.⁶ It was the time for the “*sesta*” [siesta], they were resting and talking casually until I approached. In the background was a green landscape surrounded by mountain chains and smoking chimneys, a common spectacle created by the activities at the Reduc oil refinery located on the other side of the Sarapuí River.

I began to speak with Laura,⁷ a *catadora* who I already knew and who at the moment was watching a recording of a fictional film that used the landfill as a location. Some of the *catadores* worked as extras, by doing their regular work, and she was part of this group. When asked her opinion about the scene that we watched, Laura activated many memories of that space, as well as those of the companions around her who were listening to us: “this scene that they are making there, I think that it will be very emotional, because it will be like a horror film. We are fighting, facing difficulty. [...] The film is thus revealing the slavery, people struggling”

Me: “how do you imagine the story of the film?”

Ilana: “capturing real life. What we go through”.

Laura: “right? It’s real life. Not what we have now. What it was like in our times of slavery here, it was deep suffering”.

Me: “the slavery you speak of is the picking of recyclables here, as it was in the past?”

Laura: “it’s the suffering. We picked in suffering. There was a guard there at the gate, she here knows that the man was wretched. He was horrible. And there were no trucks to bring the material, there was a set time”.

Eunice: “it was through the water, we went into the mangrove”.

Jeová: “at that time, this material that we picked here was all carried by hand, in our arms”.

Laura: “and Benito [the guard at the time] cut the bags with a knife and took everything”

Jeová: “in the past, the guard came and burned the bags, and everyone

lost a lot. We were always upset. We suffered. The suffering in the past was very strong here in this garbage (dump). It wasn't easy, no. Today it's all easy".

Me: "and how did this change take place?"

Eunice: "everything changed with the removal of the guard. First came some guards who were more understanding, who did not humiliate the *xepi*⁸ so much. We were humiliated here inside. We came to work, we didn't know if we would go home, there were many accidents, lots of things happened here with the *catador*. Now we can say it's a "sea of roses". We suffer, but not so much as we did in the past, you understand?"

Far from the meanings commonly attributed and the stigmatizing stereotypes that circulate in images promoted by the media, the Metropolitan Landfill of Jardim Gramacho (AMJG) in practice did not correspond to the idea of a social void. The recurrent and always repeated representations that emphasize an absence, privation, and need as keys to understanding this universe, compose a misleading portrait of an "end of the world", a miserable place apart from society, lacking in basic conditions that usually confer a status of "humanity". From this perspective, a location characterized by the monumental accumulation of waste and discarded objects cannot be anything else but a space alien to the state and its orders and degrading in contrast to civilized values and ways of life, in sum, a place at the margin.

What this image hides is the fact that these spaces are not isolated locations, limited to beyond the frontier that separates society, civilization and, ultimately, humanity. To the contrary, garbage dumps and landfills articulate an infinity of flows, regions, materialities, and processes, and in this sense, "integrate" the city, to the degree to which they centralize the waste management system. By this same logic, the wastes are not merely useless and despised things that constitute a problem but objects that are eminently mediating, which create and maintain a series of connections. From this perspective, the waste and the spaces characterized by their massive presence gain a positive meaning, to the degree to which they agency a multiplicity of relations, composing a heterogeneous network that operationalizes and sustains urban infrastructures that are essential to life in the cities.

We thus return to Laura's story. In 2011, when we met, the landfill at Jardim Gramacho had been operating for 33 years and Laura had completed 29 years as a *catadora* at the location. Inaugurated in 1978, the enterprise was conceived as a definitive solution to the issue of urban sanitation and the destination of waste from the metropolitan region. It was planned during the military regime, in the realm of the recently created Foundation for the Development of the Metropolitan Region of Rio de Janeiro (Fundrem), under the direct administration of the federal government, which transformed the locality into an "area of national security". The engineering project called for the "impediment of the invasion of the area by *catadores de lixo* [garbage pickers] (*xepi*), to

avoid problems in the operation of equipment or [the creation of] foci for transmission of disease” (Nascimento, 2002, p. 43). And although it was conceived with the best techniques known at the time, the design was discharacterized during its implementation⁹ and the landfill was inaugurated without respecting the parameters and the current legislation, as a “lixão” or garbage dump.¹⁰

The account of Laura’s memories and those of her fellow *catadores* describe the work and the mode of operation of the landfill in the period encompassed by its operation in an irregular manner, a situation in which it remained for approximately 14 years, attracting an increasingly larger population of people interested in collecting the materials dumped there, which also accumulated progressively in the landscape. This period was marked by difficult working conditions, insecurity and violence expressed by the absence of structures such as trucks to transport the recyclables collected; and the existence of abuses and humiliations practiced by the guards, who expropriated the materials from the *catadores*; by the risk of accidents and constant fires because of the lack of piping and proper treatment of gases expelled by the detritus; and the privation and the fencing off of the access the women used to reach the location for collection, which left them highly vulnerable, given that they had to cross the mangrove by foot to enter the site.

The characterization of the past experience at the Rampa is synthesized by Laura with a statement that refers to the marks and effects on her own body: “we picked in suffering”. Her colleague Jeová complemented this by affirming that “everything was carried by hand, in our arms”. This experience of suffering in the exercise of the activity of picking through the garbage for recyclable materials was qualified by Laura as “our times of slavery here”. This phrase resonates beyond the personal or generational experience of Laura and her companions and can be placed in historic perspective, considering the analysis of the governing of the waste and the technical measures that compose the waste management systems of a distant past, which date back to the first days of urban sanitation in Rio de Janeiro.¹¹

This retrospective movement refers to a colonial Rio de Janeiro marked by slavery, and reveals historic specificities of the modes of urbanization of the city. In colonial society, under the slave regime, African blacks were encumbered with nearly all urban activities, in particular the construction of infrastructure, the provision of services, including those relating to water supply and the disposal of excrement.

In the nineteenth century, Rio de Janeiro became the political, administrative and commercial center of the Portuguese empire, a change of status due to the arrival of the Portuguese court to the city, which operated considerable social and political transformations with the expansion of the urban economy and the civilizing demand for infrastructure services, above all to suitably house the nobility and the elite of what was then the imperial capital (Prior, 2008). Rio

in the nineteenth century was deeply African and between 1821-49 had “the largest urban concentration of slaves in the world since the end of the Roman Empire” (Alencastro, 1997, p.24).

Domestic and public hygiene in colonial and imperial times of the city was conducted by enslaved blacks whose bodies were the technical devices that operationalized the waste management. “The system of sanitation of Brazilian cities was for a long time the ‘tigre’” (*tiger*), as the barrels of excrement were vulgarly known, and which enslaved blacks carried on their heads from the houses to the beaches to be dumped in the sea, and which denominated with time the captive subjects themselves, who were required to perform this service, as Gilberto Freyre reported (1999, p.461; 1996, p.197). He also points to the fact that their existence delayed the installation of sewerage services. The *tigres* were on the lowest level of the enslaved, suffering an even more intense stigma, doubled by the relation that this activity required them to establish with the waste.

Historically retracing waste systems, we recover the connections that give meaning to Laura’s memories by emphasizing the suffering caused by the exercise of the activities of handling waste, materialized in the body, to the degree to which “it was all carried by hand, in our arms”. These arms and hands that raised and supported the city, cleaned the streets, carried the waste, and collected materials were black bodies, enslaved, violated, and submitted to subaltern positions of social structure. The presence of these bodies points to a literal and incarnated dimension of the notion of “people as infrastructure” (Simone, 2004), in which hands, arms, members and bodies function as operators, consisting in socio-technical mechanisms of urban systems.

This manual and human condition, in a more or less visible manner, and under changes of status of formal to informal, would persist over time as a center of the waste politics and constant target of disputes over urban infrastructures for waste management and forms of inhabiting the city. To analytically emphasize this human dimension, Fredericks (2014) proposes the notion of “vital infrastructures” considering sanitation workers in Senegal, while Amy Zhang (2019) considers workers responsible for waste in the Chinese context with the idea of “*invisible labouring bodies*”.

In keeping with recent formulations (Andueza et al., 2021), I prefer to think in terms of “people as embodied infrastructure” to accentuate the material, racial and corporeal dimensions that historically support urban infrastructures, bringing into focus the racism, colonialism, and structural inequalities that cast light on the political dynamics of the present, indicating permanences, given the systematic attempts at exclusion of these people from the system itself, despite the centrality that they have in practice.

The colonialist dimension that permeates the production of waste was emphasized by Liboiron (2021, p.6) when thinking of colonialism in a more persistent and subtle way as “*a set of contemporary and evolving land relations*

that can be maintained by good intentions and even good deeds". Although this argument focuses on Indigenous lands, it provides inspiring clues for reflecting on the continuing forms of colonialism present in large cities, which have actualized violences, exploitations, and inequalities in relation to "land" in the very framework of the formation of modern cities. This is particularly valid in contexts marked by the diaspora of the Black population, which was "integrated" to the structure of urban space under the racist domination of the colonial regime of slavery, as the history of Rio de Janeiro paradigmatically demonstrates. In this sense, upon addressing waste management in metropolitan Rio, this study helps to qualify recent research that focuses on the relationship between race and the city (Barone; Rios, 2019), indicating contemporary consequences of the fact that the urban development of Latin American cities was racially structured, "characterizing the very populational distribution in urban space" (Silvério, 2019, p.28).

**"So I mounted a kitchen here inside":
lives and debris at the margins of the city**

Upon speaking of her experience at the landfill, "struggling, with difficulty", Laura indicates changes at the site and her story develops other meanings of the relationship with this territory, which go beyond suffering. In the conversation, she commented that "I never cooked again at the *ramp*", remembering how it all began:

So I placed a kitchen here inside. I began to cook with a twenty-liter tin. I sold hot snacks, in the morning I took 300 fritters, I sold each one for one Real and at lunch time there were no more, and it grew. People liked them. Soon I was already giving lunch to forty people. But there was so much food! Many things were disposed here, at times boxes full of frozen food that was still good. If salmon appeared, I made salmon, if feijoada appeared, I made feijoada. I made all kinds of food. So everyone ate with me. Even the guards ate everything. There were no limits no. I got these tubs of ice cream, other cans of cereal that I filled, cause you know that xepiros eat, right? That's how I earned my living, for eight years cooking inside here, on the ground."

Then her kitchen ended, "people started paying attention to that, which ruined everything, I got angry and stopped", and Laura continued at the landfill only recycling. She said that she liked this work, however, her family did not like the work that she did. In her narrative, she expressed the feelings she still held for that place "where we raised our grandchildren, right? I raised a child, grandchild, and already have two grandchildren, a boy and a girl. So, its where I thank God, that God placed me in this little place that I am". Although she demonstrated she was tired from the nearly thirty years at the *rampa*, "my strength is depleting", Laura no longer picked waste "up on top", which she justified by the fact that "my friends are all in the cooperatives", and also because, according

to her evaluation, there was nearly no more material because of the closing of the landfill. About this she affirmed “I will really miss it”, adding “I’ll only leave here when the *rampa* is terminated”.

The Jardim Gramacho landfill had approximately 1,600 *catadores* at the time that I did my research, and operated non-stop, receiving trucks all day and all night. The *catadores* took shifts, some preferred to work at night, because it was more calm, others liked the agitation of working during the day in the company of the others. In early 2011, the landfill still received about 9,000 tons of waste per day and the *catadores* worked in these mounds of materials, triaging, and separating that which could have value to resell it in the recycling production chain. The manual activity of the *catadores* at the landfill, which fed the recycling industry through various commercial circuits that were more or less informal, involving cooperatives, scrapyards, micro industries, and other establishments, complemented the municipal waste management and urban sanitation systems, jointly composing with them the residual infrastructure of the metropolitan region.

The territories characterized by the massive presence of waste open gaps and allow the creation of opportunities. The activity of the landfill led to complex combinations of objects, spaces, people and practices, moving the entire economy of waste at the site, in which *catadores* engaged to extract and take advantage of monetary gains (Millar, 2008; 2018; Lima, 2017). For this reason, the experience of the *catadores* at the landfill can be defined not only as a source of suffering, but also as a “refuge”, which offers them greater autonomy in daily life, in a context of profound instability and precariousness (Millar, 2014, p.35).

The history of Laura and her kitchen does not only illuminate the entrepreneurial hustling (“*viração*”) and the economic dimension that permeates daily life of the popular classes, but also other dimensions that are sedimented through ties with space, and that allow understanding why many *catadores* resisted the idea of giving up the activity at this site, expressing their preference to stay there. These dimensions are permeated by emotions that involve the production of personal relations, friendships, moments of leisure and spaces of sociability marked by laughter, jokes, and provocations. These elements go beyond the strict realm of work, having the Rampa acquire specific contours and conferring other meanings of belonging to the *catadores*.

As one *catadora* often told me “the Rampa is democratic” and in fact the giant pile of discarded objects and detritus at Jardim Gramacho, with the slope having reached 40 meters in height, took on airs of a true entity for the pickers, who called it mother (“Rampa mãe”, “mãe Rampa”). This denomination articulates care in their semantic field, by referring to one who provides, who gives and allows life, while maintaining the ambiguity specific to garbage, being also what constantly places them in danger, and can cause injury or lead to death.¹²

This ambiguity is present in the memories and experiences of Laura and her colleagues, when recalling the constant fires and accidents, the occasions when they nearly lost their life, the violence, arbitrariness, and humiliations by the guards, of the difficulties and the suffering from the lack of the right to access and lack of work tools and equipment. These episodes also indicate the transformations through which the landfill historically passed, which accompany changes in social concepts, state plans and forms of governing territories and populations, and constitute processes by which the city is produced.¹³

After the inauguration of the landfill in an irregular manner in the 1970s and its operation as a garbage dump for 15 years, the international environmental conference Rio-92 was the historical mark responsible for the site's remediation and adjustment to current norms, transforming it into a controlled landfill, which would allow the presence of *catadores*. Among the actions that corresponded to the recovery of the site are the development of technical solutions for the treatment of liquid effluents and biogas, to avoid fires, the restoration of the mangroves, the special coverage of the area destined to hospital waste, the monitoring of the entrance of people and trucks, as well as the formation of the first cooperative of *catadores* in the neighborhood. Twenty years later, on the eve of the event Rio+20 which was one of the megaevents hosted by the city in the decade of 2010, the landfill at Jardim Gramacho ended its activities after 34 years of operation.

The emergence and decadence of the Jardim Gramacho landfill leads us to reflect on the spatial and urban dimension of the work of the *catadores*, as forms of life that make the city.¹⁴ The examination of its materiality in retrospective over time allows inquiring what the landfill encompasses in its layers. What sweat, struggles, sufferings, and histories compose the texture of these materials that are buried? The Rampa is composed of affective densities, social ties, lives, but also contains violence and expropriations in the sediments of its layers.

Gordillo (2014, p.11) proposes the notion of rubble [ruins] to examine space negatively, "by way of the places that were negated to create the geographies of the present". This anthropologist thus provides a stratigraphic perspective of space, which helps us to think of the previous forms of use of territories that were destroyed. The transformation of the landfill, after its "closing", into a biogas plant, points to these "modern" sedimentations and transformations that "cover up", burying the history of the *catadores* there. These technologies and technological enterprises reconfigure the residual infrastructure, and based on its promises of modernity (Larkin, 2013; Anand et al., 2018), actualizing a stigmatizing discourse about the *catadores*, which in practice operates their deterritorialization. They must redefine new circuits, strategies and organizational forms to obtain recyclable materials, given that access to the raw materials dumped at the landfill was barred to them. The concession of rights to the exploration of gas passed to the private sector.¹⁵ Thus, the waste politics is also constituted by conflicts and struggles over the right to the city.¹⁶

The Jardim Gramacho landfill is a privileged object for thinking of the city, to the degree to which it composes urban geographies of waste from “marginal” territories like the Rampa. The emergence of these spaces in the landscape of cities corresponds to the demarcation of new urban frontiers by plans and policies for waste, and the (re)definition of new centers from the establishment of distant places at the urban perimeter, creating new margins. Marginal here assumes a positional meaning, and therefore perspective. To focus on the perspective relative to this marginal position and the relations that connect both positions making them mutually constitutive is what the concept of residual infrastructures seeks to emphasize. We thus reveal prominent dimensions that tend to remain opaque, like the economic dimension.

Centralized by the spaces of garbage dumps and landfills, the residual infrastructures place in operation large global markets, whether through the tremendous recycling industry, which annually generates US\$200 billion (Millar, 2018, p.8), or through investments in technologies for generating biogas and energy from garbage. Upon thinking of the “closing” of the landfill as an infrastructural event, we track actors, interests, strategies, and disputes, placing in focus the power relations that permeate and constitute the waste politics, to observe in the remodeling of the residual infrastructure the reproduction of injustices and inequalities.

A ride with Severino: waste management technologies and rearrangements of the city

It was an intuitive gesture. Immediately after I casually commented that I was leaving, the *catadora* with whom I was speaking shouted out to a vehicle that was heading towards the landfill exit, to ask it to stop. My interlocutor walked up to the truck of the Comlurb company and after a short explanation, she got me a ride. That was how on that day I returned from Jardim Gramacho, in the municipality of Duque de Caxias, to Rio de Janeiro, the city where I lived. I climbed up into the sumptuous vehicle, which was recently cleaned and looked new, and as soon as I entered the air conditioned cab I began to speak with Severino, the driver, who kindly accepted my company for the trip.

Severino was from Brazil’s Northeast, said he had three children and liked to dance at the “Feira dos Paraibas”.¹⁷ He lived in Jardim Gramacho for nearly 40 years, even before the landfill was built, at a time when he could bathe in the Rio Sarapuí. Severino defined Jardim Gramacho as an “industrial neighborhood” and, referring to the surrounding favelas, said that the neighborhood was “not just that there”, there was also a “rich part, with only big houses”.

“Garbage brings money”. With this observation, Severino began to say that he had already been involved in the collection of recyclable materials from the landfill: “at the time I tried to pick garbage at night but couldn’t find anything. It’s very hard, you earn money, but it’s hard”. He commented that some pickers could earn R\$ 3.000, R\$3.500 per month working 12 hours a day,

but he said he was satisfied with his job as a driver, “I like my work. I don’t earn well, but I don’t earn badly”.

Severino had been working for fifteen years at Comlurb, the municipal sanitation company in Rio de Janeiro. The truck that he drove, like the entire fleet of trucks circulating at Comlurb, was outsourced, to a company called Júlio Simões. At the time, Severino had already unloaded twice in the new area for waste in the municipality of Rio de Janeiro, in Seropédica, nearly 70 kilometers from the capital, where the Waste Treatment Center (CTR) was built, to substitute the Jardim Gramacho landfill. When the vehicle reached the waste transfer station of Comlurb in the neighborhood of Cajú, I thanked him and said goodbye, because the trip was over.

The period of this ride was a unique historic moment, marked by a significant transition represented by the “closing” of the Jardim Gramacho landfill, which until then had been a strategic element of the waste management system of the Rio de Janeiro metropolitan region. The termination of activities at the landfill, disactivated in 2012, operated an infrastructural change, with the rearrangement of the waste management system, which had implications on various scales.

The ethnographic description of the ride with Severino provides us a shifted perspective about the space. Driving with him provided the perspective of the waste landfill not as a static space involved only with itself, but as a site connected to other enterprises, located in various urban spaces, which are part of waste systems and constitute the city’s residual infrastructure.

In his narrative, Severino described a trajectory taken on his trips as a driver at Comlurb, which included the Jardim Gramacho Landfill, the Waste Transfer Station (ETR) of Cajú and the Waste Treatment Center (CTR) at Seropédica. The construction of the latter enterprise, which triggered conflicts and resistance from the local population (Pereira, 2020), was strategic to the degree to which it made logistically viable the closing of the landfill in operation until then, by offering an alternative location to dump waste, which operationalized the rearrangement of the waste management system.

The Waste Treatment Center at Seropédica is run by the company *Ciclus*.¹⁸ Founded in 2010, *Ciclus* is a concession of Comlurb formed as what is known as a Specific Purpose Corporation [(SPE) to conduct the integrated solid waste management. With the slogan “transforming waste into assets” in the institutional presentation of the company, the Waste Treatment Center is identified as “the safest, most modern and efficient solution for handling solid waste, residential and from large sources”.¹⁹ Composed of a “group of integrated technologies”, the center includes a bioenergetic sanitary landfill, a station for capturing and treating biogas for generating clean energy, and a station to treat liquid effluent to transform it into water for reuse. In addition to transforming waste into “clean and renewable energy”, *Ciclus* affirms that it has resolved “one of the largest environmental problems in Rio de Janeiro state by

closing the Gramacho Metropolitan Landfill”. As a consequence of its search for “innovative solutions” the company affirms that it has “attracted investments in the expansion of already existing industries and in the arrival of others, generating more employment, increasing the value of the municipality and sustainable growth”.²⁰

Ciclus combines two business groups: the logistics of the Waste Transfer Stations (ETR) is the responsibility of the company *Julio Simões*, while the waste treatment technology, including the technical design and institutional model, was developed by *Haztec*.²¹ Its operations in Rio de Janeiro state included four waste treatment stations located in the municipalities of Nova Iguaçu, Barra Mansa, São Gonçalo and Seropédica, all administered under public concessions through local municipalities. In 2009, the company was indicated as “one of the strongest in Brazil in environmental services”.²²

The description of this enterprise presents three specific actors who entered the realm of waste management, which proposes other uses for the objects discarded and gives agency to new markets with global connections. These economic agents have enormous financial capital and mobilize investments that are materialized in the construction of infrastructure in which technology is a central element and are associated to notions of “modernity” and “sustainable development”. This waste management model is guided by the *technological modernization* paradigm,²³ and is justified by promises of effective technical control over the world (Brouwer et al., 2010).

From this perspective, the *catadores* become symbols of an obsolete and unsustainable model, which creates tensions and disputes between the *catadores* and actors who appear as representatives of an emerging billion dollar market. This process reveals diametrically distinct logics and proposals for waste management. Based on them we can consider waste management policy and the waste politics in Rio de Janeiro, identifying some standards and their implications.

Catador politics: popular socio-environmentalism and alternative citizenships

Waste and its infrastructures were foundational to the production of modern cities, with the cleaning of European cities of the nineteenth century being a key moment in the emergence of urban liberalism through the disciplining of bodies (Cooper, 2010). Meanwhile, in Latin America, particularly in Rio de Janeiro, urban development was marked by colonialist racism, with the exploitation of Black bodies operationalizing systems for providing urban services, as indicated by the example of the “tigers”. This population was integrated to the social structure in a profoundly unequal manner, and these racialized structures of inequality persist in the waste systems over time.

The notion of “people as embodied infrastructures” sought to highlight this process, indicating the persistence of colonialisms in modern waste management systems, to the degree to which their human, “sociotechnical” or “vi-

tal” dimension have been systematically denied or disqualified, with the people that sustain the management systems suffering repeated attempts to exclude or marginalize them, despite the fact that they are fundamental to the practical operationalization of these systems.

By ethnographically analyzing the closing of the Jardim Gramacho landfill as an infrastructural event, we present dimensions and aspects in play in the change of infrastructures, revealing a waste politics. The transformations due to this rearrangement reveal an arena in which the private sector, represented by business groups linked to investment funds and financial capital, dispute territories, projects, and waste, based on the technological modernization paradigm and its promises, with operations characterized by a strong tendency towards monopolization. In this dispute, these actors reconfigure the city through large technological projects, based on the generation of energy from waste, actualizing the infrastructures as technologies of liberal and neoliberal government (Anand et al., 2018; Wakefield, 2018).

The concept of *residual infrastructures* develops an analytical prisma that can integrate formal and informal waste systems, bypassing the frontier mobilized as a mechanism to delegitimize the practices of the *catadores*. We use the concept to reveal the socio-technical dimension found in the bodies and work of these actors, to recognize them as a constitutive and legitimate part of the infrastructure. In this way, by analytically focusing on the residual position of the infrastructure, we restore the centrality of the action of the *catadores* for the urban dynamics dedicated to waste, which allows qualifying it, casting light on persistencies and resistances despite efforts for their erasure.

On this basis, we sought to think of waste policy from the perspective of the politics of *catadores*, highlighting the concepts and strategies for action of the “marginal” actors of infrastructure. In the past two decades, *catadores* have been organizing themselves, highlighted by the foundation of the National Movement of Collectors of Recyclable Materials (MNCR), a pioneer initiative that became an international reference (Gabard, 2011), and that was able to stimulate the construction of the National Solid Waste Policy, a milestone of waste management in the country, which was sanctioned in 2010.

Before enactment of Law n.12.305, which established the National Solid Waste Management Policy, the National Movement of Collectors of Recyclable Materials had issued a public note²⁴ requesting that the Brazilian president veto the article that presented “energy use” as one of the options for suitable environmental destination of waste, although it was not granted. Since then, organizations of *catadores* have been denouncing this and expressing their opposition to the exclusionary character of these waste management technologies in Brazil. In contrast, they present a proposal for “popular recycling”, based on selective collection with solidarity, through cooperatives, guided by principles of socio-environmental equity and justice (Pérez, 2019).

The closing of the landfill directly affected the neighborhood and its population, impacting the thriving local economy of waste, amid the deep crisis that followed the various megaevents held in the city, (the 2014 World Cup and 2016 Olympics), which was marked by the removal of President Dilma Rousseff and the rise of Jair Bolsonaro and his project to destroy the social and development policies of the previous Workers Party governments. This situation was aggravated by the health crisis caused by the Covid-19 pandemic, whose dramatic consequences have materialized in the sharp rise of unemployment, inflation, and extreme poverty, with an intensification of informal practices, including the collection of discardable objects in the streets.

Given that for the *catadores* the closing of the landfill cut off their access to their main source of raw material in the region, entities, organizations and leaders of *catadores* of Jardim Gramacho have been reformulating their strategies for action and mobilization to obtain recyclable materials and continue to work (Lima, 2018). This is expressed in efforts undertaken to maintain the cooperatives, and to pressure city governments to contract them for waste management, with proper payments for the environmental services provided.²⁵

One of the main struggles of *catadores* in Jardim Gramacho is now focused on the establishment of fair conditions in the organization and implementation of the reverse logistics system for packaging, and proper payments to actors who give a correct destination for waste, based on the principle of “polluter payer, protector receiver”. The *catadores* expose the inequalities that organize the industrial sector, focusing on the large multinationals, who annually place thousands of tons of products in the environment, without properly assuming responsibility for the life cycle of waste generated by their activities.

The universe agencied by waste and the infrastructures produced by them are inextricably linked to the political dimension that permeates the relationship between the practices of workers, the disputes and inequalities that shape urban space, and the potentialities and limitations in the construction of forms of citizenship (Fredericks, 2018; Samson, 2009)

By calling for the construction of waste management systems and recycling markets based on more just conditions for the actors who work at the margins, the *catador* politics that emerges from the residual infrastructures goes beyond a struggle to define alternative citizenships, highlighting “*trashworkers’ vibrant political refusal to be refuse*” (Fredericks, 2014, p.533). But, by enacting a popular socioenvironmentalism in search of more decent living conditions and modes of existence that are inclusionary and equitable, an arena of dispute is constructed in which their bodies, and the ways of life that they engender, by forging other modes of inhabiting the world, also sketch projects for the city that offer imaginary, symbolic, and material conditions for the production of other possible futures.

Notes

- 1 Catadores or “pickers” are people who collect and sell recyclables at a dump or on the streets of a city for a living. Their work can also be done in cooperatives.
- 2 This study led to the thesis published in the book Lima (2021), which adds to the contributions of social studies of waste or “discard studies”. In this article I return to the ethnographic material to conduct an analysis from a distinct perspective, that of the “infrastructural shift” opened by the field of studies about infrastructures. In this sense, the reflection is inserted at the intersection of these two recent multidisciplinary academic fields with growing international importance.
- 3 The French concept of “agencement” and the Portuguese equivalent term “agenciamento” have been translated in this article as “agencing”, following Franck Cochoy’s (2014) discussion of the concept in translation. Cochoy points out, from his discussion of Michel Callon’s theory of agencing, that “this means both arranging it [the world] (agencing as producing specific agencements) and putting it in motion (agencing as ‘giving agency’, i.e. converting some people, non-human entities, or ‘hybrid collectifs’ (Callon & Law, 1995) into agents, or rather actors).” (Cochoy 2014: 117).
- 4 For an ethnographic application *avant la lettre* of the idea of residual infrastructures see Lima (2020).
- 5 According to data from the Censo Demográfico de 2010, conducted by the Instituto Brasileiro de Geografia e Estatística (IBGE), 66% of the catadores declare they are “negros” (blacks and browns) (Sant’Ana e Metello, 2016), a number that reached 74% in other analyses (Ancat, 2018, p.17).
- 6 Native designation of the location where waste was dumped and at which the *catação* [picking] was exercised at the landfill. With the volume of materials accumulated assuming the form of a hill, the “ramp” also generically referred to the landfill site as a whole.
- 7 The names used are pseudonyms.
- 8 *Xepeiro* is a pejorative term that had been used in the past to refer to *catadores* or garbage pickers.
- 9 In keeping with the temporality “still under construction, already in ruins” described by Cavalcanti (2021).
- 10 In this text the site at Jardim Gramacho is referred to as a landfill, both before and after it had been brought up to code. But in fact the site was always closer to a simple garbage “dump”.
- 11 For a detailed historic analysis of the governing of waste and waste management systems in Rio de Janeiro, see Lima (2021).
- 12 Cases of accidents, people buried by waste dumped by trucks, and illness from tuberculosis and other diseases were not uncommon.
- 13 Mariano Perelman (2010) reflects on the historic relationship between the spaces destined to waste and the production of the city based on the case of the closing of the La Quema dump and transformations in the forms of conceiving the work of the catadores in the context of Buenos Aires.
- 14 Millar (2018) proposes thinking of the activity of the pickers as “ways of life” to escape the dualism between formal and informal, using a conceptual strategy that is not based

on the paradigm of salaried work and incorporates other dimensions to understand the relationship of catadores with the landfill, not only as work or economic relations, but as ontological experience.

- 15 Which, with specificities, historically re-enacts the opposition between *enclosures x commons* (O'Hare, 2017)
- 16 This process takes on global contours, and is implemented through distinct local configurations in countries in both the global South, like India, (Sharma, 2021), and North (Alexander; Reno, 2020)
- 17 The Luiz Gonzaga Center for Northeastern Traditions, also known as the Feira de São Cristóvão or Feira dos Paraibas, is produced by migrants from Brazil's Northeast who live in Rio de Janeiro to promote cultural traditions from the Northeast.
- 18 Available at: <<https://ciclusambiental.com.br>>.
- 19 Available at: <https://web.archive.org/web/20130818172927/http://ciclusambiental.com.br/ciclus_ctr.php>.
- 20 Available at: <https://web.archive.org/web/20130818172927/http://ciclusambiental.com.br/ciclus_ctr.php>.
- 21 Available at: <<https://extra.globo.com/noticias/economia/mulheres-responsaveis-pelo-novo-aterro-sanitario-em-seropedica-tem-desafio-de-transformar-lixo-do-rio-em-ativo-ambiental-177333.html>>.
- 22 Available at: <http://www.istoedinheiro.com.br/noticias/1694_O+EMPRESARIO+QUE+VEIO+DO+MAR>, Acesso em: 12 jul. 2012. Reproduzido em: <<http://www.terra.com.br/istoedinheiro-temp/edicoes/614/artigo143880-1.htm>>.
- 23 See Lima (2021).
- 24 To see the complete note: <<http://www.mnrc.org.br/artigos/mnrc-pede-veto-a-incineracao-na-politica-nacional-deresiduos-solidos>>.
- 25 About agendas and mobilizations of catador politics in Rio de Janeiro: <<https://www.residualab.uerj.br/organizacao-de-catadores-gestao-de-residuos-e-politica-no-rio-de-janeiro/>>.

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ABSTRACT – The article explores the relationship between waste and cities through the prism of urban infrastructures, and proposes the concept of “residual infrastructure” as a strategy to analyze the *residual*, not hegemonic, dimension of waste management systems, focusing on change processes that reconfigure the infrastructure excludes elements deemed marginal, despite their actual centrality. The ethnographic focuses the “closure” of the Jardim Gramacho landfill, in the Rio de Janeiro metropolitan region, considered as an “infrastructural event” that mobilized a contentious arena between different actors and technological repertoires, configuring the waste policies. The notion of “people as embodied infrastructures” qualifies the waste pickers that collect recyclable material as socio-technical systems and reveals the persistence of colonialisms in modern waste management, which continue to shape urban geographies and (re) produce racialized structures of inequality. Waste-picking policies are thought of as a kind of popular socio-environmentalism capable of forging citizenship models and alternative projects for the city.

KEYWORDS: Waste, Infrastructures, Sociotechnical systems, Colonialisms, City-making.

RESUMO – O artigo explora a relação entre resíduos e cidade a partir do prisma das infraestruturas urbanas e propõe o conceito de “infraestruturas residuais” como estratégia para analisar a dimensão *residual*, não hegemônica, que se constitui nos sistemas de gestão, enfocando processos de mudança que reconfiguram a infraestrutura operando a exclusão de elementos considerados à margem, apesar de sua centralidade prática. O foco etnográfico se volta para o “fechamento” do aterro de Jardim Gramacho, no Rio metropolitano, pensado como um “evento infraestrutural”, que mobiliza uma arena de disputa entre distintos atores e repertórios tecnológicos, configurando uma política dos resíduos. A noção de “pessoas como infraestruturas corporificadas” qualifica os catadores como sistemas sociotécnicos e descortina a persistência de colonialismos nos sistemas de gestão de resíduos modernos, que continuam moldando as geografias urbanas e (re)produzindo estruturas racializadas de desigualdade. A política catadora é então pensada como um socioambientalismo popular capaz de forjar modelos de cidadania e projetos de cidade alternativos.

PALAVRAS-CHAVE: Resíduos, Infraestruturas, Sistemas sociotécnicos, Colonialismos, Produção da cidade.

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