South cities: situated and subaltern knowledge to confront the climate crisis in Brazil

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Global climate crisis effects increasingly threaten urban environments, with cities in the Global South disproportionately impacted by climate injustice and a colonial legacy of insufficient infrastructure. This study investigates local actions in the Grande Bom Jardim region of Fortaleza (Brazil) aimed at reconfiguring the human-nature relationship through the integration of situated and subaltern knowledge. Employing a qualitative case study methodology, the

Introduction

The effects of the climate crisis are accelerating globally, with unprecedented environmental catastrophes reported daily. In the Global South, these phenomena manifest in a particularly devastating manner, constituting clear evidence of climate injustice (Huq & Shafique, 2023; Scotti Rodrigues & Pereira, 2023). This scenario is further exacerbated by the colonial legacy present in cities, reflected in urbanization processes marked by insufficient infrastructure to absorb the impacts of climate change.

Although scientific advances have broadened our understanding of climatic phenomena, tangible changes remain rare, and projections point toward scenarios of intense devastation (IPCC, 2023). Amid this panorama, local and self-organized initiatives emerge as promising alternatives to reverse environmentally imbalanced contexts in Southern cities (Goh, 2015; Olazabal et al., 2021).

Based on this observation, this study aims to identify ways to manage territories

research systematically documents community responses, including ecological trails, environmental and sanitation caravans, and climate march, to reveal the pivotal role of territorial knowledge in addressing the management of territories facing climate impacts. Findings demonstrate that self-organized practices not only enhance environmental monitoring and education but also challenge conventional technical approaches, underscoring the importance for decolonial urban governance. The study concludes that incorporating localized epistemologies is essential for developing equitable and sustainable solutions to the climate crisis.

facing the effects of the climate crisis. Through research into the actions of local groups, we seek to identify the existence of components of situated and/or subaltern knowledge. The research adopts the case study method, through the systematization of actions, and reveals territorial knowledge as a central component in the practices developed in the Grande Bom Jardim (GBJ) region, in Fortaleza (Ceará, Brazil). This approach underscores the importance of integrating local knowledge into the formulation of public policies and strategies to combat the climate crisis, reinforcing the need for a decolonial and environmental justice perspective to transform the relationship between society and the environment.

Climate Crisis and Urbanization: Legacies and Local Responses

The climate crisis is not a recent phenomenon, it is frequently associated with a geological period known as the Anthropocene, which is characterized by the significant impact of human activity on the world (Crutzen & Stoermer, 2000). Among the various theories discussing the starting point of this period, the process of industrialization, accompanied by urbanization, represented a turning point in the development of cities, provoking a noticeable acceleration in the concentration of carbon dioxide in the atmosphere (Gaffney & Steffen, 2017). The Intergovernmental Panel on Climate Change (IPCC) has been dedicated to developing a specific report on cities, to be released in 2026, in order to comprehensively understand the challenges of different global urban contexts and to propose solutions tailored to each type of region (IPCC, 2024). Therefore, to this day, it is not possible to conceive alternatives to the climate crisis without necessarily rethinking the process of urbanization.

In the Global South, the process of urbanization is characterized by an intense growth of informal settlements, largely located in the periphery and establishing diverse relationships with natural resources (Davis et al.,

2007; Huq, 2024). This urbanization is not homogeneous, political, economic, and environmental factors lead to different forms of appropriation of urban space and interaction with nature (Roy, 2011; Randolph & Storper, 2023). However, historically, we can associate the countries of the Global South with territories that suffered from colonization processes and were exploited by economic powers, resulting in the loss of part of their territorial and intellectual wealth (Quijano & Ennis, 2000; Mignolo, 2017). In general, colonization directly influences the process of urbanization as it stimulates the extraction of both material and immaterial resources, which is associated with intense socio-spatial inequality (Gomes, 2023; Holanda, 2023).

As a product of this urbanization process, cities that are spatially isolated emerge, with limited and poorly distributed urban infrastructure and, consequently, low capacity to respond to increasingly intense environmental emergencies (Schramm, 2016; Shackleton & Gwedla, 2021). The intensification of extreme events such as storms, heatwaves, and severe droughts, not only becoming more frequent, exposes and exacerbates socio-spatial inequalities (Goh, 2019). The most vulnerable areas, generally located in the peripheries, have a lower capacity to recover in the face of extreme weather events (Cortese et al., 2023).

Therefore, the precarious settlements located in the Global South are the territories that will disproportionately suffer the consequences of the climate crisis. This imbalance is referred to as climate injustice (Borg et al., 2021; Scotti Rodrigues & Pereira, 2023). Furthermore, the low response to risks and disasters, social inequality, the exacerbation of health issues, and gender disparities combine to demonstrate that the overlap of different vulnerabilities exacerbates the situation of climate injustice (Jabeen, 2019; Huq & Shafique, 2023).

Various sectors of society acknowledge the devastating consequences of the climate crisis and recognize the need for global cooperation and support for the most vulnerable groups. However, the measures implemented to date have not resulted in substantial reductions in the planet's temperature. Monitoring of global temperature shows constant growth, with 2023 being the warmest year in the past 125,000 years (WMO, 2023). It is in light of this scenario of little concrete progress in reducing global warming that this work is developed.

At the global level, during the Conference of the Parties of the United Nations Framework Convention on Climate Change (COP) in 2022, the Loss and Damage Fund for countries vulnerable to climate change was established. This fund functions as a form of environmental compensation that holds major global polluters accountable for contributing to the adaptation and mitigation of the effects of the climate crisis in the Global South. However, the amounts deposited in this fund are still negli-

gible when compared to the magnitude of the problems faced by these nations, and the fund is not yet fully operational (Pinto, 2022).

Such resources could be applied, for instance, in the Amazon Rainforest, given its significant role in the global ecosystem and its location in the Global South (Donoso & Reicher, 2024). Despite its visibility and the various resources directed toward its protection, this biome has faced many difficulties (Carvalho et al., 2024). In recent years, due to various federal initiatives, this biome has been recovering, albeit not at the necessary pace (Paiva Toledo, 2024).

More broadly, in Brazil, we observe considerable efforts to establish policies and plans to contain the effects of the climate crisis, yet significant results are still not evident. The National Climate Change Policy of 2009 and the National Adaptation Plan of 2016 encompass strategies and actions to promote climate adaptation at all levels (national, regional, and local) foreseeing the participation of all stakeholders (Sotto et al., 2019; Neves et al., 2021). However, the absence of climate adaptation plans and risk assessments remains, particularly at the municipal level (Borde et al., 2024).

Thus, what we observe in practice is that Brazilian cities, especially the precarious settlements, remain in a state of vulnerability and are increasingly pressured by extreme and recurrent weather events. In light of this scenario of limited progress, residents of precarious settlements are seeking survival alternatives through self-organized community actions (F. L. de Oliveira et al., 2016; Ferrara, 2022).

The challenges of coexisting with nature have long been present in precarious settlements. Situations such as flooding and urban heat islands are recurrent, and residents have been developing varied forms of interaction with nature and managing these situations. Often, these actions are characterized by a lack of financial resources and technical-scientific knowledge, yet they are capable of generating an alternative form of knowledge.

This manifestation of resistance and the development of survival strategies by marginalized groups cannot be dissociated from their specific context and local challenges. For this reason, the knowledge developed by these groups can be considered as situated knowledge (Santos & Meneses, 2009).

This type of knowledge is also part of a process of exclusion and erasure experienced by the residents of precarious settlements. Subaltern knowledge has the potential to challenge power relations, as it directs attention to the self-identified needs of subjugated actors and groups and creates alternative sources of resources that contest the imposition of externally driven, large-scale projects. Subaltern knowledge is that local, grassroots knowledge that is connected through social relations. It encompasses knowledge that is integrated with the culture, practices, and worldviews of diverse groups. Subaltern knowledge constructs an

understanding of what is possible and what matters for communities and citizens residing in a given location (Olazabal et al., 2021).

Therefore, the knowledge produced within precarious settlements to confront the challenges of the climate crisis is intimately related to the possibility of reversing the colonial urbanization process mentioned at the outset. This study, therefore, aims to analyze the actions of local groups that possess components of situated and subaltern knowledge connected to the fight against the climate crisis.

Critical Ecology and Community-Based Methodologies in Urban Planning

This work adopts an approach based on critical ecology, as it aims to explore the relationships between society and the environment from a perspective that challenges traditional models of urbanization. The community responses to the climate crisis, which will be described below, are anchored in the theories of climate justice and decoloniality, in order to guide the analysis toward the construction of more just and equitable models of social development (Swyngedouw & Heynen, 2003; Rougeon, Mota & Trad, 2023).

In other words, the political ecology approach will be used to analyze how community responses in GBJ connect with issues of climate justice. Meanwhile, the social innovation approach will explore how the practices carried out within GBJ can create innovative strategies for addressing the climate crisis. Finally, the transformative change approach will examine the long-term potential of community initiatives to combat the effects of the climate crisis.

This is a qualitative study that employs the method of developing a case study located in Brazil, a former Portuguese colony. Considering the colonial legacy present in Brazilian cities, we highlight Fortaleza as the densest capital in Brazil, according to the Brazilian Institute of Geography and Statistics (IBGE, 2022), with a strong presence of precarious settlements that have often developed in environmentally sensitive areas. This characterization will be developed in detail in the next section.

The method reflects the longstanding partnership between the Federal University of Ceará (UFC) and the different groups operating in GBJ, a territory recognized for its social organization. The Programa de Educação Tutorial (Tutorial Education Program - PET) of the Architecture and Urbanism Course at UFC undertakes various actions in conjunction with the Rede de Desenvolvimento Local Integrado e Sustentável do GBJ (Integrated and Sustainable Local Development Network of GBJ - Rede DLIS), always establishing horizontal dialogue, respecting local demands, and prioritizing the exchange of knowledge. The author began her relationship with GBJ in 2016, when she started her master's degree in the Graduate Program in Architecture, Urbanism, and Design (UFC) and began studying the Lagoa da Viúva Urban Park[1].

In light of this background, the *in-loco* data collection relied on participant observation and the subsequent systematization of information gathered during field visits and both in-person and virtual meetings with residents and public agencies. Social networks were another relevant research source, as they play an important role in communication and record-keeping for the groups studied. It is important to emphasize the action-research aspect present in this work.

This research method proves to be adequate because it is capable of correlating information collected in the field, such as residents' testimonies and facilitates a deeper understanding of urban dynamics that is not accessible through conventional databases. Furthermore, the researcher's direct and intensive engagement with the research subject deepens the theoretical reflection.

In more detail, the method followed the steps described below:

1. Identification of activities carried out by groups involved in the defense of environmental areas in GBJ;
2. Categorization of these activities according to their effect on addressing the climate crisis;
3. Selection of a set of representative activities based on their scope;
4. Description of the component that characterizes the presence of situated and/or subaltern knowledge contained in this set of activities.

Fortaleza's Urban Transformation: Precarious Settlements and Environmental Challenges

As with other Brazilian cities, the urbanization of Fortaleza began in the 1960s, driven by an intense migratory process motivated by employment opportunities associated with recent industrialization (Costa, 2009). The city was unprepared for the intense population influx, which settled in areas unsuitable for human occupation, such as riverbanks and dune fields. In this same period, the proliferation of precarious settlements in Fortaleza intensified (Aldigueri, 2017), thereby representing the colonial legacy in the city's urbanization process. Today, Fortaleza is the fourth most populous capital in the country, with nearly 2.5 million inhabitants, of which 100,000 live in precarious settlements located in areas at risk of flooding, flash floods, and landslides (IBGE, 2022). The Maranguapinho River basin shelters many of these precarious settlements, primarily along its course. GBJ is a region composed of five neighborhoods (Siqueira, Bom Jardim, Granja Portugal, Granja Lisboa, and Canindezinho) that concentrates a large number of precarious settlements. It is a region historically neglected by the State, with limited urban infrastructure, constructed through spontaneous housing, predominantly inhabited by black and poor populations, and stigmatized by urban violence (Dantas & Favarin, 2021; Freitas et al., 2019; Ribeiro & Lima, 2024).

The degradation of the natural environment

in GBJ occurs due to several factors. The first is associated with the expansion of the area through the filling in of lagoons, a practice very common in the 1980s in a context of lacking infrastructure, such as road systems and drainage networks. In addition, the lack of sanitary sewage systems, a reality that persists to this day, causes environmental impacts such as the pollution of water resources by domestic effluents (UFC, 2019).

This urbanization process also brings additional aggravating factors. Fortaleza is a coastal city with a tropical-humid climate that experiences little temperature variation throughout the year. Although there is no explicit demarcation of seasonal changes, Fortaleza has a period known as the rainy season, occurring from January to April. This period is recognized by residents of precarious settlements as a time of significant losses, due to material damages caused by floods and inundations. In GBJ, residents report increased intensity and irregularity of rainfall in recent years.

The State, in turn, when it abandons its posture of neglect and assumes an interventionist stance, fails to reverse the degradation. In 2012, the State Government completed a dam on the Maranguapinho River with the aim of reducing the flooding in Fortaleza, however, the desired result was not achieved, and the floods persisted (Santos & Araújo, 2019). Also at the state level, a large urbanization project for the Maranguapinho Riverbed was undertaken, which led to the removal of hundreds of people between 2011 and 2017 to housing complexes (Pequeno & Carvalho, 2018). The lack of integration of this project with policies to reduce the housing deficit resulted in the population returning to occupy the riverbanks (Cela & Souza, 2019). An interesting feature of this project was the creation of the Multiparticipatory Institutional and Intersectoral Working Group (GTMI) in 2009, through pressure from the Rede DLIS, as a participatory body that met quarterly to facilitate the monitoring of the project by the population. However, the GTMI was dissolved around 2014, making this monitoring difficult and, consequently, the consideration of residents' points of view (Almeida, 2014).

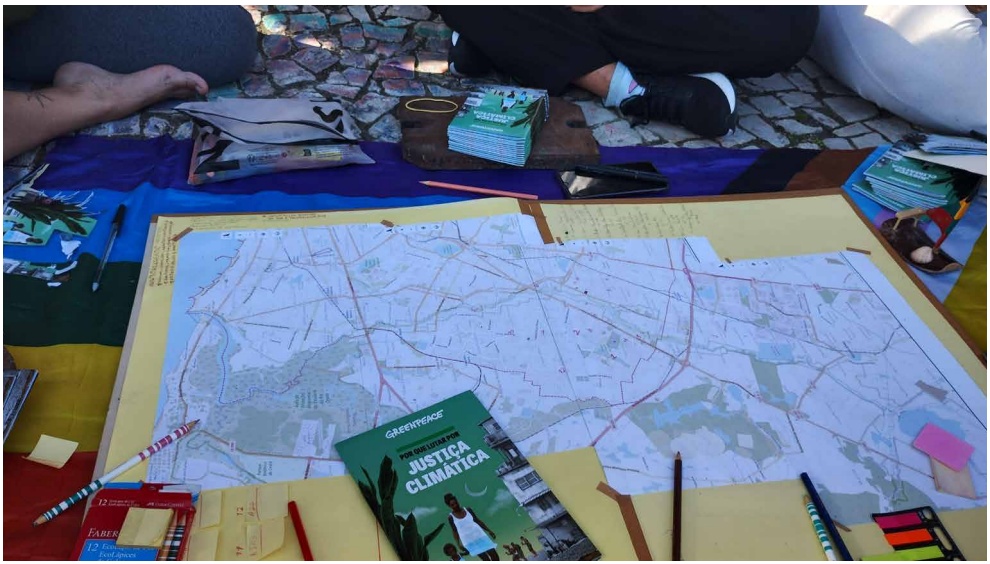
More recently, in 2019, the Fortaleza City Hall eliminated an environmental zone established in the Master Plan in order to construct housing, thereby reducing the vegetated area of GBJ (Frota & Freitas, 2024). In 2020, the Fortaleza City Hall undertook drainage works in the Marrocos community, located in GBJ, which did not resolve the flooding problem (Costa Lima et al., 2023). In other words, even with large and medium-scale interventions, the situation of degradation and environmental risk remains. Both situations were also carried out without guaranteeing popular participation and without considering the residents' point of view.

The design concept and execution of the works described above still follow a colonial logic, since they do not highlight local knowledge and do not

seek to establish a dialogue with the population through effective participatory processes.

This mode of territorial occupation has been undergoing a process of questioning involving the actions of various groups present in GBJ. The first event evidencing this process was the emergence of environmental collectives in the early 2000s that demanded the protection of the Pulmão Verde do Siqueira (Green Slung of Siqueira), a significant green area. More recently, the Rede DLIS has become a fundamental organizing instance in environmental defense, working to strengthen other groups (Machado & Pereira, 2020). The Rede DLIS originated from the efforts of various groups, including the Centro de Defesa da Vida Herbert de Souza (Defense Center of Life Hebert de Souza - CDVHS), and has been active in the region since the early 2000s, bringing together approximately 50 other organizations operating across the five neighborhoods of GBJ (Almeida & Freitas, 2021). These groups are engaged in diverse agendas such as the right to the city, youth, culture, and food sovereignty. One of its first actions was the development of a participatory environmental diagnosis, created in conjunction with the Ceará State University in 2015.

Based on the history of actions aimed at protecting the natural environment, this study set out to deepen the understanding of the various environmental actions and identify the existence of situated and/or subaltern knowledge components connected to combating the climate crisis. The first step was to systematize the various actions that took place in the territory, this data collection began with the Decolonial Cartographies Workshop. This workshop is part of a broader project entitled "Dreaming the Dancing Rivers: Affective Mapping of Rivers in the Territories of Grande Bom Jardim," which received funding from the Bom Jardim Cultural Center. Its primary objective was to recognize the region's natural wealth while also strengthening the community's connection to its territory. Through the implementation of ecological trails, cartography workshops, and tree planting activities, participants identified sites of cultural significance, leisure areas, and zones with considerable presence of local fauna in a mapping exercise that fostered greater appropriation of community space. This activity was conducted by the Fórum de Políticas Ambientais (FPA) do GBJ (Environmental Policies Forum of GBJ) in 2024 (Figure 1). This group was established in 2022 with the aim of bringing together organizations that develop environmental initiatives within the territory of Grande Bom Jardim. As part of the Rede DLIS and in partnership with other groups, the FPA is composed of residents, students and university professors, geographers, environmental scientists, local leaders, and individuals already engaged in community struggles within the territory, among others. The participants vary widely in age, ranging from youth to the elderly, and also re-



Decolonial Cartographies Workshop.
Source: FPA, 2024.
Fig.1

present a broad spectrum of income levels. Today, the FPA can be understood as a space for dialogue that promotes activities throughout the Maranguapinho River basin, focusing on issues such as combating environmental racism and fostering the population's connection to the territory.

The objective of this activity was precisely to produce a map of the groups operating in the territory in relation to environmental issues. The information initially mapped was enriched with other activities that occurred after the workshop, as well as through the author's prior knowledge of other manifestations in the territory.

Below is the list of identified activities during the workshop along with a brief explanatory description:

- (PL) Planting: A gardening activity that involves the free acquisition of seedlings of native species, the selection of strategic locations, and collective planting;
- (ET) Ecological Trail: A walking activity along a predetermined route accompanied by landscape observation and discussion. This activity is similar to those described below:
- Environmental Caravan: A social technology2 that involves traversing the territory with designated stopping points in strategic locations to record the environmental situation;
- Sanitation Caravan: A social technology that involves traversing the territory with designated stopping points in strategic locations to record the state of sanitation;
- Climate March: A route undertaken to discuss the climate crisis in the periphery;
- (RE) Recycling: An activity involving the collection of solid waste, sorting, and forwarding to recycling companies;
- (UG) Urban Garden: An activity of planting

edible species for human consumption, carried out in partnership with the Rede de Cozinhas Comunitárias3 (Community Kitchens Network);
- (RS) Recovery of Open Spaces: An activity of cleaning a plot of land and creating urban furniture from repurposed materials;
- (MQV) Maranguapinho Quer Viver (Maranguapinho Wants to Live): A cultural festival that highlights the Maranguapinho River;
- (DE) Denunciation: Applying pressure on public authorities to obtain effective responses, such as holding public hearings or conducting inspections;
- (BC) Bioconstruction: An activity of constructing buildings using permaculture techniques;
- (WS) Workshops:
    - Arts workshop: A recreational activity based on an environmental theme;
    - School workshop: An educational activity to connect schools with nearby environmental areas;
- (LE) Legislation: The creation of legislation through pressure on public authorities to meet community demands.
- After the identification of the activities, they were grouped into categories based on the effects they produce in addressing the climate crisis. This classification was made to ensure functional rigor by highlighting the impact each type of action can have on the territory. The categories are as follows:
    - Environmental Recovery: Actions that promote the regeneration of degraded ecosystems in the face of climate change, contributing to carbon sequestration, biodiversity conservation, and microclimate regulation.
    - Community Engagement: Strategies that strengthen social participation and popular organization, enhancing the capacity of communities to collectively respond to the impacts of the climate crisis and demand sustainable solutions for their territories.
    - Environmental Education: Initiatives that disseminate knowledge about the causes and consequences of the climate crisis, promoting awareness and the adoption of sustainable practices at both the individual and collective levels.
    - Popular Monitoring: Activities that enable the tracking and documentation of local environmental impacts, generating data that supports decision-making and the demand for public policies aimed at climate mitigation and adaptation.
    - Sanitation: Measures that improve waste management and access to adequate sanitary infrastructure, reducing water body pollution, disease proliferation, and the effects of environmental degradation exacerbated by climate change.
    - Food Sovereignty: Practices that strengthen local food production in a socially sustainable manner, through collaboration with Rede de Cozinhas Comunitárias, reducing

communities' vulnerability to supply crises and ensuring access to healthy food in scenarios of climatic instability.

- Leisure: Actions that encourage people's reconnection with the environment and promote well-being in natural spaces, strengthening the bond with ecosystems and encouraging their preservation in the face of climatic threats.
- Culture: Artistic expressions and cultural events that raise public awareness about the climate crisis, fostering dialogues on environmental justice and stimulating collective mobilization for local solutions.
- Negotiation with Public Authorities: Strategies of political pressure and institutional articulation aimed at ensuring effective state responses for climate mitigation and adaptation, thereby guaranteeing the implementation of more just and efficient environmental public policies.

CATEGORY	ACT1	ACT2	ACT3	ACT4	ACT5	ACT6	ACT7	ACT8	ACT9	ACT10
environmental recovery	PL							BC		
community engagement	PL	ET			RS	MQV		BC	WS	
environmental education	PL	ET				MQV			WS	
popular monitoring		ET								
sanitation		ET	RE		RS			BC		
food sovereignty				UG						
leisure					RS					
culture						MQV			WS	
negotiation							DE			LE
TOTAL	**3**	**4**	**1**	**1**	**3**	**3**	**1**	**3**	**3**	**1**

Activities organized by categories based on effects of combating the climate crisis.
Source: organized by the author, 2025
Tab. 1

The category of community engagement is the one that featured the most activities.

This is likely because the groups operating in the territory recognize community engagement as a prerequisite for enabling the other activities. In turn, the most recurrent activity was the Ecological Trail, which encompasses the Environmental Caravan, the Sanitation Caravan, and the Climate March. Therefore, due to their recurrence and similarities, these three activities will serve as the basis for deepening the discussion on the type of knowledge they produce.

The three activities described below derive from a single typology, namely the ecological trail. Based on a predetermined route designed to foster interaction with a naturalized area, the ecological trail is a collective activity that provides a greater connection with nature and promotes knowledge about areas that are often unfamiliar to residents. On several occasions, different environmental movements in GBJ have conducted ecological trails with the aim of bringing the population closer to naturalized areas, promoting environmental education, and even carrying out community monitoring.

The environmental threats observed along the trails range from the identification of areas of deforestation through burning, the construction of precarious dwellings in environmentally protected areas, the raising of large animals that cause soil compaction, and even an episode of illegal land subdivision in an environmental area promoted by a candidate for city council in exchange for votes.

The case of Lagoa da Viúva clearly illustrates the significance of ecological trails. As early as 2012, the CDVHS initiated a series of ecological trails with the goal of recognizing and enhancing the visibility of this green area. The ecological trails, conducted on foot or by bicycle, were frequently combined with other activities such as tree planting and environmental monitoring. In addition to fostering community engagement, these actions generated reports documenting environmental crimes, which were subsequently submitted to the Public Prosecutor's Office.

In 2015, the outcome of these initiatives, anchored by the ecological trails, was the official designation of the area as an Urban Park. Building on these trail-led efforts, Lagoa da Viúva was incorporated into the city's Green Areas System and, in 2020, received an investment of approximately R$13 million for its urban development, which included the construction of a promenade, recreational, and sports facilities (Frota and Freitas, 2024).

Ecological trails at Lagoa da Viúva continue to take place to this day. In 2024, an ecological trail conducted at Lagoa da Viúva Urban Park by the FPA, aimed at monitoring, encountered an area in flames. The FPA itself was responsible for calling the fire department and containing the fire (Figure 2). On that same trail, fences were identified that prevented access to part of the park. This type of information is widely disse-

Members of FPA trying to control the flames in Lagoa da Viúva Urban Park.
Source: FPA, 2024.
Fig. 2

Environmental Caravan in Matinha (Granja Lisboa).
Source: FPA, 2024.
Fig. 3

Workshop as a part of Sanitation Caravan in the Marrocos Community.
Source: Costa Lima et al., 2023.
Fig. 4

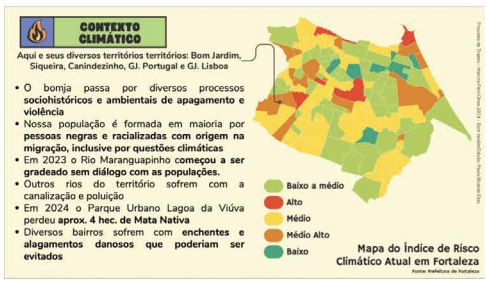
minated on the FPA's social media and by supporters with the aim of raising awareness of the various damages to green areas in the region.

Caravans are a social technology widely used by the Rede DLIS (Almeida & Freitas, 2021) and, more recently, have been carried out by various groups. Their objective is to traverse the territory, conducting reconnaissance and recording important demands for residents, who subsequently use this information to self-organize. Environmental Caravans are distinguished by prioritizing routes with strategic stops in locations where remnants of vegetation or water bodies are present and threatened by deforestation, pollution, and other hazards. The Bons Jardins Urbanos group is one of the leading actors in conducting Environmental Caravans that have visited the Lagoa da Viúva Urban Park (Siqueira), the Matinha (Granja Lisboa - Figure 3), and sections of the Maranguapinho River (Araújo, 2020).

In contrast, the Sanitation Caravans traversed the territory with a focus on problematic issues related to the drainage network and sewage system. The first Sanitation Caravan took place in 2016 to record the condition of a treatment plant. In 2022, additional Sanitation Caravans were conducted to monitor the works in the Marrocos Community with the support of the ZEIS Observatory (Figure 4 - Costa Lima et al., 2023).

Although the two types of Caravans have distinct themes, their overall impact on the territory in terms of combating the climate crisis is very similar. Notable aspects include the active role of residents in delineating and executing the route, the interaction with residents who, even if not actively participating in the Caravan, engage in dialogue about the observed situation during the route, and the integration with other activities, such as workshops, which facilitate reflective moments about what was observed. Therefore, the Caravans have the potential to raise residents' awareness, foster greater community mobilization, and even promote community tourism (Frota & Freitas, 2024).

The Climate March is similar to the Caravans in that it is an activity that also traverses the territory according to a predetermined route. However, the Climate March is a larger event,



Climate March

Source: FPA, 2024.
Fig. 5

Document defending the Climate March in GBJ.

Source: FPA, 2024.
Fig. 6

one that has already been held by other groups in different contexts in Brazil. The Climate March in GBJ had the theme "From the Sertão to the Sea", aiming to foster state unity by referencing Ceará's biomes (Figure 5). In 2024, the Climate March was held in the GBJ territory with strong involvement from the groups comprising the FPA over several months. The Climate March consisted of a series of events, including the participation of local artists, a food sale fair, and the pedestrian route itself. The event brought together around 20 collectives and approximately 400 participants. We highlight the Climate March as one of the most impactful activities when compared to the aforementioned Caravans, given its number of participants, duration, and the number of groups involved.

Some events and issues, which occurred during the organisational meetings for the Climate March, are useful here for the purposes of discussion. A recurring agenda item was which area of the city the Climate March would take place in. Other collectives from Fortaleza proposed more central areas as options due to ease of access and their status as reference points for previous demonstrations. However, in the document organized by the FPA group (Figure 6), the defense for GBJ was grounded in the need to highlight the struggles of a peripheral area and the importance of ensuring that the Climate March did not reproduce structures of environmental racism through the exclusion of the periphery. Following consensus, the route was defined by considering logistical aspects such as bus parking, stopping points that included environmental areas (e.g., a stretch of the Maranguapinho River), and busy streets, so that the message about the climate crisis could reach a broader audience along the route.

It is important to note that Climate March also manages to bring together groups outside the GBJ, such as participants from other environmental movements. This impact is very relevant, especially for deconstructing the stigmatized view of the GBJ as a territory of violence and for strengthening collaboration networks.

It is important to note that the relationship established between the various groups operating in GBJ and the public authorities is, in general, a critical one that seeks to engage in dialogue in order to advance local demands. However, in the face of a lack of dialogue or ineffective responses, environmental groups pursue alternative strategies of advocacy, seeking other means to ensure their rights are upheld and to hold the authorities accountable. Thus, these groups participate in invited spaces, such as public hearings and Municipal Environment Council meetings, but also create their own invented spaces through the various previously mentioned actions (Miraftab, 2012). Conversely, the public authorities often relate to the territory through clientelist practices during election periods, establishing an exchange of favors for votes (Freitas, 2019).

Territorial Knowledge and Policy Integration: Bridging Theory and Practice in Climate Action

In order to answer the research question, we need to connect the theory addressed with the results obtained through the case study. The three activities described above share the common component of traversing the territory. During this journey, it is possible to develop a variety of actions to confront the climate crisis. Community engagement is perceived when individuals are involved along the route. Popular monitoring occurs when strategic areas are visited, environmental crimes are recorded, and subsequently reported to the authorities. Environmental education takes place as discussions about the importance of green areas occur. Likewise, the struggle for the implementation of sanitation systems emerges from the community's understanding that this is their right. The development of these actions necessitates an in-depth knowledge of the territory.

Knowledge about the territory in the Caravans involves selecting strategic stopping points, areas that are either well-naturalized and representative for the population or areas that, although still unknown, play a significant role in the environmental dynamics. Furthermore, territorial knowledge encompasses an understanding of the threats that may endanger these areas.

In the case of the Climate March, territorial knowledge involves choosing wider streets capable of accommodating large numbers of people, selecting routes with significant pedestrian traffic to ensure visibility, and identifying stopping points that can safely host crowds. During the execution of the Climate March, territorial knowledge also entails anticipating groups that might block streets to manage the flow of participants. Ultimately, the territorial component of the Climate March promotes the visibility of a city region that has been systematically erased, a legacy of colonial urbanization.

Three environmental activists, residents of the periphery of Fortaleza and organizers of the 2024 Climate March, highlighted several important aspects regarding the impact of this activity (Lopes, Virginia, and Cavalcanti, 2025). The first point concerns the relationship between environmental awareness and territory, they emphasized that learning occurs based on where you are, the people around you, and is always linked to action. In the words of Quezia Virgínia:

> The mind thinks where the feet stand. This process is very much about learning from where you are, with whom you are, with the people around you. It is learning by planting, learning by harvesting, learning by struggling (Lopes, Virginia, and Cavalcanti, 2025). [4]

The second point refers to the role of the Climate March in making the discussion about the climate crisis more relevant and accessible to the peripheral population. The Climate Mar-

ch becomes a tool for reaching people who do not have access to other spaces for debate, people for whom these issues, such as environmental racism, are part of daily life. Through the dialogue generated along the route of the Climate March, with those present on the sidewalks, a process of belonging begins to take shape. This process deepens through the idea that the Climate March is, above all, also a moment of celebration, affirming the existence of peripheral populations through culture.

The final point concerns the proposal for greater political engagement through education. One suggestion is to establish closer ties with local schools, so that environmental issues are considered in the everyday lives of children and young people. On a broader scale, there is a plan to make environmental education a school subject, developed from a critical perspective.

The activities reflect the residents' autonomy in choosing their routes. It is essential to recognize that there are areas where access is restricted due to the presence of parallel power structures. Thus, to maintain the safety of activity participants, it is necessary to have the ability to navigate through spaces that do not endanger anyone's life.

Territorial knowledge is a type of knowledge that is developed entirely in connection with the territory. It is the product of years of living in that space and establishing relationships that ensure mastery over the region's functioning. Therefore, territorial knowledge can be considered a form of situated knowledge. It is generated in consonance with the territory and cannot be produced elsewhere, precisely because its very situatedness and suitability to the locale depend on being generated there. The "subalternization" of territorial knowledge in GBJ is a direct consequence of the colonial legacy, manifesting in the spatial configuration of favelas, which are territories historically rendered invisible and characterized by acute social inequalities, a persistent lack of urban infrastructure, and severe environmental degradation. These areas are further erased through urban projects shaped by external, technocratic logics, typically disconnected from local realities, developed without meaningful popular participation, and inattentive to local ecological balance. Illustrative cases include the Maranguapinho River urbanization project and the sanitation interventions in the Marrocos Community.

In this context, territorial knowledge becomes a crucial tool for reducing inequalities by fostering various forms of visibility, whether internal or external. Internal visibility refers to residents' increasing engagement with underutilized green areas through initiatives such as Environmental Caravans. It also encompasses the community's growing involvement in discourses on environmental racism during the Climate March. External visibility arises as non-residents come to better understand the defining features of GBJ via diverse Ecological

Trails, and as environmental crimes are publicized through social media and formal complaints to the Public Prosecutor's Office.

While this enhanced visibility remains far from complete, it nevertheless constitutes an essential initial step towards transcending colonial processes, strengthening residents' connection to, and stewardship of, their environment.

This argument leads us to believe that knowledge about the territory is fundamental for the effective implementation of policies to combat the climate crisis. To overcome the climate crisis, there is no alternative but to decolonize solutions through the application of territorial knowledge. One crucial means of achieving this is to place the people who live in the territory, those who understand its dynamics and possess this territorial knowledge, in prominent positions within the city's decision-making processes. This primarily occurs through public sector support for the institutional strengthening of groups that are already engaged in territory-based initiatives, as illustrated by the examples mentioned above.

There are, in fact, actions that value territorial knowledge and have already been implemented. In 2023, the Federal Government established the National Secretariat for Peripheries, under the Ministry of Cities, as a means of fostering closer engagement with these types of territories. Since then, the National Secretariat for Peripheries has allocated financial resources to support the activities of groups operating directly within peripheral areas. An illustrative example is the 'Periferia Viva' Program, which provides funding to small-scale groups, often lacking a consolidated administrative structure and, in many cases, not legally formalized. This funding model is noteworthy because it prioritizes organizations that promote grassroots community initiatives, such as CDVHS, the FPA, and Bons Jardins Urbanos. This type of action could inspire the expansion of public policies and be adopted at the state and municipal levels as well. However, it is important to note that such initiatives may entail a populist tendency, raising the risk of co-optation of social movements and, consequently, their internal weakening.

There are other successful examples of the valorization of territorial knowledge that have already been implemented in GBJ. During the development of the Integrated Land Regularization Plan for ZEIS Bom Jardim, the technical team established a field office in an institution widely recognized by the population. This space functioned as the daily workplace for the technical team, served as a venue for collective activities, and was always open to visits from residents. Another strategy adopted in this Plan was the hiring of social mobilizers, community leaders endowed with extensive territorial knowledge, to lead external activities and promote community engagement.

These activities enabled greater access for external researchers to the territory, allowing for

a clearer understanding of territorial knowledge and its incorporation into official documents, such as the Urban Plan. They also fostered increased participation among residents by expanding the volume of information shared between community members and researchers, which, in turn, allowed a broader range of perspectives to be included. Finally, it is worth noting the establishment of bonds between researchers and residents, which further facilitated the exchange of knowledge at multiple levels. These activities are led by university-based groups, composed mostly of individuals from outside the territory, yet who intentionally seek to establish a decolonial relationship with local residents. For this reason, such practices are of particular interest for potential incorporation into public policy.

Therefore, it is necessary for public policies to include the component of territorial knowledge as a fundamental element. Recruiting professionals who already work in the region, providing financial support to residents, and establishing local structures are initial measures that can contribute to this goal. We conclude our discussion with the reflection that the territory is a true field of formation, serving as a school of essential and irreplaceable learning.

Conclusion and Future Directions

The preceding discussion demonstrates that Global South cities face severe challenges in combating the climate crisis, with interventions in precarious settlements still largely designed only around technical-scientific knowledge. However, given the complex pressures imposed by climate change, it is imperative to incorporate other forms of knowledge, especially situated and subaltern knowledge, to develop more holistic and effective responses.

In light of these findings, several limitations of the current research should be acknowledged. First, the reliance on a single case study may not capture the full diversity of experiences and strategies across different urban contexts. Additionally, while qualitative methods have provided rich insights, a broader methodological approach could further substantiate the claims presented. These limitations highlight the need for future research to expand both the scope of case studies and the range of participatory methods employed, ensuring that a wider array of local practices and epistemologies are represented.

As a next step, further analysis of the GBJ case could problematize the concept of ecological transition. Evidence suggests that the GBJ territory has been undergoing such a transition since the early 2000s, well before the issue gained formal recognition, through the actions of environmental collectives and self-organized initiatives aimed at reimagining the relationship between urbanization and nature. Future studies could also explore how the evolving relationship between the population and nature is manifesting in practices that protect

remaining green spaces and increasingly focus on the restoration of degraded areas.

Moreover, there is merit in further examining the role of alternative forms of knowledge in community governance. The contributions of the Rede DLIS and various environmental collectives offer a promising example of alternative governance structures that emerge from the interaction between the State, community networks, and informal leadership. These models not only challenge conventional approaches but also provide a blueprint for integrating situated knowledge into public policies aimed at mitigating climate impacts.

In summary, the evidence presented in this work converges on the pursuit of a collective reimagining of urban futures anchored in reducing the dichotomy between humans and nature. The integration of situated and subaltern knowledge systems is essential for crafting urban climate strategies that are both equitable and effective. Future research should build on these insights by addressing the identified limitations and expanding the analytical framework to encompass a broader spectrum of urban contexts and governance models.

Notes

[1] Since 2016, the author has alternated between the roles of university researcher, environmental activist, and technical advisor. This multiplicity of perspectives has shaped the work's unique format and depth. The author has often taken a public stance, influenced collective decision-making, and provided technical support for the development of various materials. For instance, the author contributed to the elaboration of the Plano Popular da Zona Especial de Interesse Social (ZEIS) do Bom Jardim (Popular Plan of the Social Special Zone of Bom Jardim) and led workshops and collaborative activities around the Urban Park Lagoa da Viúva. Several academic articles have also been published by the author based on these experiences. These diverse roles have been crucial in deepening the understanding of the complexity of actors involved in the GBJ urban context.

[2] It refers to a set of techniques, methods, or practices developed and applied in interaction with communities to promote inclusion, sustainability, and social transformation (Almeida & Freitas, 2021).

[3] More information in: https://cozinhascomunitarias-gbj.org.br/

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