Case Study Report

Participatory Urban Design Project

Integrating Natural and Urban Systems in Rio de Janeiro Periphery in a Proposal for Quilombo do Bomba

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Abstract

This paper centers on the experience of a participatory design studio entitled Water Sensitive Urbanism in the Metropolitan Periphery: A Participatory Proposal for APA São Bento, Duque de Caxias, Rio de Janeiro (USA), offered at the Urbanism Post-graduate Program at the Federal University of Rio de Janeiro (PROURB-UFRJ). USA responded to the demand for a State Park proposal located in São Bento neighborhood in Duque de Caxias, a city in the metropolitan region of Rio, articulated by some social movements gathered in the Fórum de Articulação da Sociedade Civil (FORAS). The participatory design studio emerged from the Laboratory of Urban Water Studies' (LEAU-PROURB-UFRJ) engagement with FORAS. The proposal from this studio is a response to the social movement's demand. It serves as an instrument for their struggle to preserve Quilombo do Bomba as an environmentally protected area. To that end, USA uses water-sensitive urbanism as a methodology applied in the Brazilian peripheral context and rethinks the metropolitan periphery in its own terms, questioning the triad of precariousness, distance, and dependence.

Keywords

Water sensitive urban design, participatory design, metropolitan periphery, Brazil, Duque de Caxias

1. Introduction

This paper centers on the experience of a participatory design studio entitled *Water Sensitive Urbanism in the Metropolitan Periphery: A Participatory Proposal for APA São Bento, Duque de Caxias, Rio de Janeiro* (USA), offered at the Urbanism Post-graduate Program at the Federal University of Rio de Janeiro (PROURB-UFRJ). USA responded to the demand for a State Park proposal located in São Bento neighborhood in Duque de Caxias, a city in the metropolitan region of Rio, articulated by some social movements gathered in the Fórum de Articulação da Sociedade Civil (FORAS). The area known as Quilombo do Bomba has 1.36 mi² and functions as a floodplain (*i.e.*, a 'sponge' area) absorbing water and minimizing the effects of floods in six municipalities in the region, which tend to worsen in the context of climate change. Due to its natural properties, Bomba was part of a much larger environmentally protected area called APA São Bento, which belongs to the Federal Government.

Nevertheless, the city government removed Bomba from APA in 2006, categorizing it as an Economic Interest Zone without previous environmental studies or public consultation, and requesting its ownership. The city's goal was to transform the area into a 'logistic gated community' (*condomínio logístico*) that would include a State Supply Center of Rio de Janeiro (CEARJ). Fearing the environmental and social effects, FORAS called upon three public hearings in 2021, reuniting all actors involved–such as the residents, social movements representatives, public administration officials, university professors, and researchers–in order to expose the arguments against the municipality proposal. Beyond these hearings, FORAS also promoted what they called 'internal seminars,' held online, and counted with researchers and community members to debate alternative views for Bomba area. After these discussions, the common understanding among specialists and the community was that the alternative proposal should be a state park, which started to materialize itself in 2021 through Bill No. 4773/2021 for the Quilombo do Bomba State Park.

The participatory design studio at the Federal University of Rio emerged from the Laboratory of Urban Water Studies' (LEAU-PROURB-UFRJ) engagement with FORAS during these public hearings and seminars and was supported by two Brazilian funding agencies, FAPERJ and CNPq, which made it possible in different ways. The proposal from this studio is a response to the social movement's demand. It serves as an instrument for their struggle to preserve Quilombo do Bomba as an environmentally protected area. To that end, USA uses water-sensitive urbanism as a methodology applied in the Brazilian peripheral context and rethinks the metropolitan periphery in its own terms, questioning the triad of precariousness, distance, and dependence (Simone, 2010).

2. Development

The participatory design studio unfolded in ten weeks and was divided into three parts: (1) site visit, (2) theoretical and technical lectures, (3) and design. In the first part, students went to the site with professors, local guides, and the social movement representative. During one day, students experienced the neighborhood where Bomba is situated by foot and by car due to the long distances. The site visit highlighted key features such as the space's materiality, size, and identity. The second part was organized into a lecture series with technicians who work with water management and environmental protection issues and researchers who study peripheral urbanization, sanitation, and contemporary business development in Rio's metropolitan periphery. These lectures helped the students group to understand the importance and potential of Quilombo do Bomba as a State Park. The first and the second parts made clear that that proposal could not be centered only on the Bomba area; it should expand itself to its surroundings. Finally, the third part was centered on the proposal development. During this time, the studio focused on desk critics and pinups with the presence of the social movement representative, who made sure the proposal was grounded on the local population's real needs, which was crucial to the final design.

These three parts complemented each other in different ways and gave students and professors a general and on-the-ground view of Quilombo do Bomba.

3. Design Proposal

The proposal was based on a water-sensitive urban design (WSUD) and centered around the idea of a sponge city, which is an urban construction model for flood management, strengthening ecological infrastructure and drainage systems (Hoyer et al., 2011; Wong et al., 2020). A sponge city can hold, clean, and naturally drain water using an environmental approach. The concept was born in China in early 2000 and resulted from the failure of the conventional gray infrastructure of flood control and stormwater

management systems. The idea of a sponge city utilizes natural wetlands to absorb water into the soil before it flows into urban streets, providing a water-resilient threshold (Austin & Yu, 2016).

Quilombo do Bomba is already a polder, a low-lying tract of land that forms an artificial hydrological entity. All polders will eventually be below the surrounding water level for some or all of the time. Thus the goal of transforming Bomba into a state park was to protect it from urban development, enhance its environmental characteristic, as well as to put new green infrastructure in contact with the community's everyday experience.

The design started with the exhaustive study of urban stormwater parks designed by Turenscape, Kodjian Yu's design studio based in China. The Harbin Qunli Stormwater and Liupanshui Minghu Wetland parks illustrate to the students several design strategies such as the platforms, footbridges, and the different levels that form a series of purification wetlands.

At the macro scale, the Bomba State Park design focuses on the flood problem in Iguaçu Sarapuí Bassin during medium rain. Firstly, existing streams, fishponds, and low-lying land were integrated into the flood control and ecological purification system along the park between both rivers, forming a series of purification and water-high absorption wetlands with different capacities. The approach not only helps with the flood issue but also can improve the river water quality, mobilizing the capacity of wetlands to remove water contaminants by a natural purification process using the vegetation, soils, and microbes. The project also proposed the creation of continuous pedestrian and bicycle paths, bringing a recreational and ecological space to the park, but most of all, connecting this green space with the neighborhoods that surround the area. Considering this park's connection with the whole metropolitan area, a new train station is proposed for the place, which is facilitated by a train line that already passes between the park and the local house settlement.

4. Reception

After almost three months of seminars, field trips, and discussions with the social movements' representative, the students and professors returned to the area to present the final design proposal to the community. The goal was not to deliver a finished product but to use the proposal as a means of dialog, a tool to foster the discussion of potentials, issues, and needs. In other words, the presentation was not an end to the State Park of Quilombo do Bomba but a beginning. With this in mind, the six students presented their design proposal to residents, social movement members, local leaders, public officials, and researchers. The audience was significant for a Saturday morning; about 30 people, including the course professors. The presentation was 25 minutes long, but the discussion lasted more than two hours. The size of the audience and the event's duration speak to the theme's relevance and the community's interest in and engagement with the proposal.

Concerning the relevance and residents' interest in the project, some people expressed their excitement about the possibility of a different vision for Duque de Caxias and Quilombo do Bomba area. For a long time, the city was viewed and planned to be one of the logistic centers of the metropolises. As a result, a concentration of industries and warehouses within the municipal boundary fosters problems such as pollution and urban fragmentation. This vision was recently reinforced by a metropolitan master plan (PDUI) by labeling Caxias as the metropolis "logistic city." In line with PDUI's idea, the current administration envisions transforming the Quilombo do Bomba area into a 'logistic gated community.' Both were contested by local social movements who blamed the former for being a top-down approach that neglects the residents' real needs and the latter for intensifying floods in at least six cities within the metropolitan region, among other issues. The State Park proposal came as a counterview to both

endeavors giving hope for a better future. As one resident said, referring to the students, “They are making us hopeful!” [*Estão fazendo a gente ter esperança* - personal communication 07/09/22].

The engagement of the community with the proposal came during and after the presentation. Some residents asked the students to clarify some points, for instance, specific locations (*e.g.*, train station, park entrances, the bus line path, and the like), the precise scope of the project, and the number of families living in the borders of the park, that will have to be resettled due to flood risk. But the main point raised was how this proposal could compete with the municipality one in economic terms (*e.g.*, costs and job creation). To be sure, no one contested the proposal of a park. Instead, they feared this counterview could be diminished as an expensive and superfluous solution. Another important point raised during the debate was that the park should reflect the history aBerkeleynd culture of Quilombo do Bomba which was home to indigenous and afro-Brazilian populations. Moreover, other participants mentioned the importance of extending the proposal beyond Bomba to neighboring environmentally key areas.

As a result of these discussions, all the participants agreed on four main takeaways. The first is to do an economic viability study of the proposal and to conduct on-the-ground research with the residents to understand the local economic vocation as well as to identify potential private investors. Both could confront the economic arguments against the state park. Third, the inclusion of some residents in the next steps of the park design gives them a leading role and empowers them to fight against visions that do not reflect their needs and will. Finally, to present the state park proposal in a public hearing with all actors involved in this process (*e.g.*, the municipality, elected officials, residents, social movements, and private actors). Unmistakably, the proposal will serve as an instrument in the struggle to preserve Quilombo do Bomba.

5. Lessons Learned

In this studio, many lessons were learned. The first was working with the water-sensitive urban design approach, which is not widespread in Brazil, neither among society nor specialists. We saw this studio as an opportunity to illustrate the possibilities of using it, especially considering the constant floods in the area that are aggravated by climate change.

The second was the participatory way that the project was conducted. It is challenging to implement a participatory design studio, bringing together the representatives of local social movements (FORAS) and the students. For example, unlike some cities in the global north (Punter, 2007), in the Metropolitan Region of Rio de Janeiro periphery–and particularly in Duque Caxias–experiences of participatory design are almost non-existent. The reasons can be attributed to a local political culture, where the voice of the most vulnerable, even if they are politically organized, is not taken into account in the decisions of local governments. The USA studio was, in this sense, an innovative experience for the local social movement.

In addition to the participatory process, the final presentation to the local community was positive and enriching. The proposal presentation brought new issues to the project, in addition to the principles of WSUD. The first was the accessibility, or the necessity to consider the needs of people with disabilities in all project dimensions. The second one was the local history and the need to incorporate references from this local history through park signs, equipment, and furniture.

The studio's practical result was a participatory methodology that can be mobilized in other peripheral contexts. The first aspect is the importance of local knowledge by mobilizing residents' expertise by articulating the theoretical-conceptual perspective adopted. The understanding of the environmental characteristics of those who experience the space daily is essential to support a project combining ideas

of people-centric planning and design, as well as sustainable urban design, for a more resilient and healthy environment.

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