Case Study Report

The Urban Terrariums in Porto Alegre - Brazil.

Municipal living areas: sustainable practices, shared management, co-creation, urban health, and vitality.

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Abstract

Urban Terrariums are public living spaces implemented through sustainable practices on small lots of municipal property – generally these lots are underused, vacant or with no pre-established use utility. As a public policy, the project aims to encourage interaction and coexistence in open spaces, the use of sustainable practices, as well as foster urban vitality and well-being and create a system of connected green spaces, contributing to the improvement of the city's environment and landscape. Implemented through partnerships with society and disseminated throughout the territory, Urban Terrariums can mitigate greenhouse gas emission and increase the city's adaptive capacity in relation to the negative impacts of climate change. In prescribing that the activities implemented should ensure the permanence of people in open spaces, the project promotes principles associated with urban well-being, such as walkability, social coexistence and contact with nature.

Keywords

Public Spaces, Sustainability, Urban vitality, Public policy

1. Introduction: how the concept came about

Urban Terrariums are open living spaces implemented through sustainable practices on leftover municipal lots that are currently underused, vacant or with no pre-established use, with a maximum total area of 500m2. The empty spaces that can be occupied by Urban Terrariums are spread throughout the city territory and, in general, are leftovers from completed highway plans, strips of land that cannot be built upon, or resulting from old land adjustment processes. Initially considered unviable areas since they lack the potential for significant building projects – due to small dimensions and irregular shapes – they can be seen in fact as an outstanding environmental and social asset.

The word "terrarium" refers to a small garden that, inserted in a glass container and ideally balanced, can ensure the survival of species placed therein. Connected to this meaning, the typology of Urban Terrarium as an open public space functioning like a small open-air "vent" for urban dwellers and the natural environment amid urbanization was devised.

The Urban Terrarium Project is regimented by Municipal Decree no. 20652/2020 and is now in its completion phase. As a small open public space, the idea materialized based on three main insights. Initially, the difficulty the city of Porto Alegre's public administration felt regarding the maintenance, management or allocation of these areas was identified. In some cases, areas were leased to the private sector and used to establish businesses or services, i.e., their use was disconnected from any public or

collective purpose. When vacant, they generally became parking lots or were used for irregular garbage disposal or invasions, thus affecting landscape conditions, sanitation, as well as urban vitality and safety.

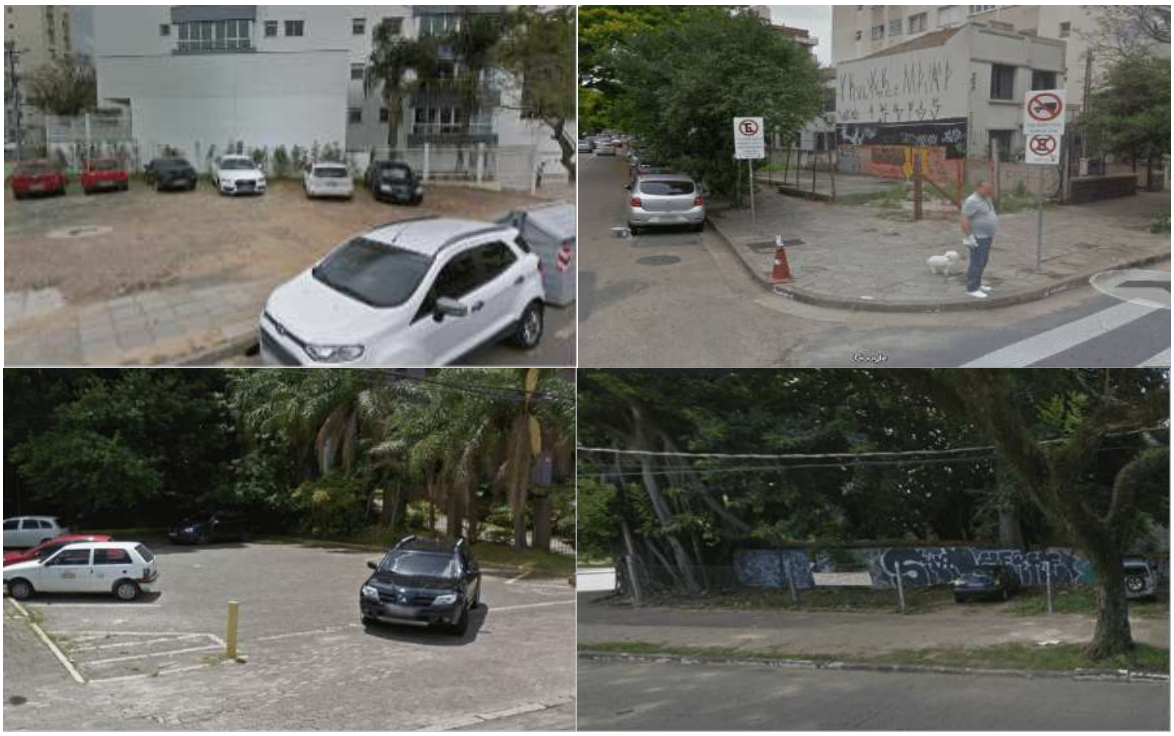

Figure 1. Some of the empty spaces in the central area of Porto Alegre where Urban Terrariums will be established: Praia de Belas, Boa Vista, Bom Fim and Bela Vista Districts. Source: the author.

The second insight stems from an urbanistic principle supported by the Complexity Theory and the Law of Zipf , stating that "a living city demands one very large green area, several medium sized ones and many smaller ones" (SALINGAROS, 2005 n.p.). This premise was the basis for creating a small-sized public space typology – the urban terrarium – added to the existing medium-sized and large parks. Besides the fact that smaller spaces can be distributed more easily throughout areas that need public spaces, Terrariums can accommodate a greater diversity of uses than conventional squares and parks. Hence, they are more adaptable to changes in urban dynamics over time, contributing to building urban resilience.

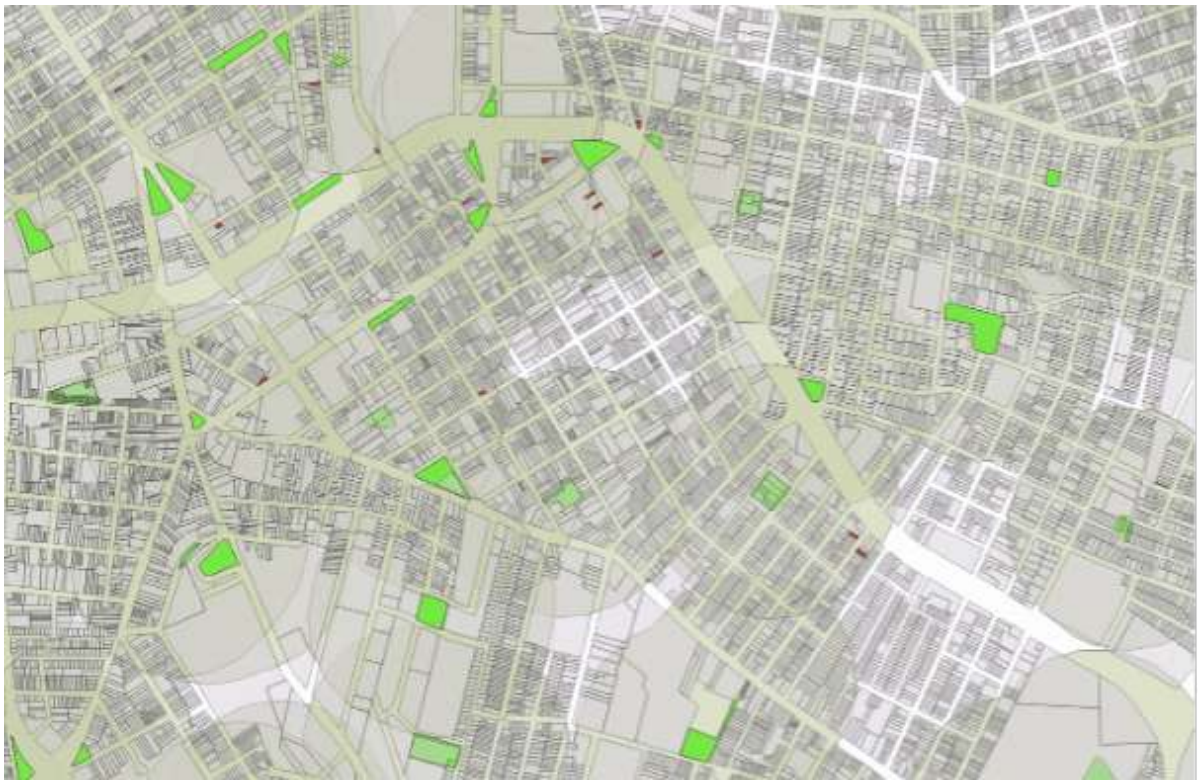

Figure 2. Part of the territory of Porto Alegre with small areas that can become terrariums marked in red. Medium-sized squares marked in green. Source: the author.

The third insight identified the need to develop the Open Spaces Program stipulated by the Urban Structuring Strategy of the Plano Diretor de Desenvolvimento Urbano Ambiental de Porto Alegre (City of Porto Alegre Urban Environmental Development Master Plan - PDDUA or Complementary Law 434/00). The program determines there be a system of connected spaces whose aims converge with the typology created: the establishment of spatial legibility, the enhancement of centralities and the promotion of social interaction (PORTO ALEGRE, 1999). The Terrarium is thus a typology than can promote a connection among medium and large-sized public spaces (squares and parks), consolidating the system.

2. The impacts

Besides these three insights, studies show that, in Porto Alegre, peripheral areas and those presenting a high level of social vulnerability have a greater need for public spaces (BALESTRO et.al, 2019) because of the informal and often irregular way these areas are occupied, and hence the non-allocation of green areas for public use, contrasting with requirements in regular sites. The impossibility of “opening” space for the creation of squares or large parks in these areas makes them good candidates for the typology of urban terrariums that can be established in small residual spaces in a large number and thus alleviate the deficit.

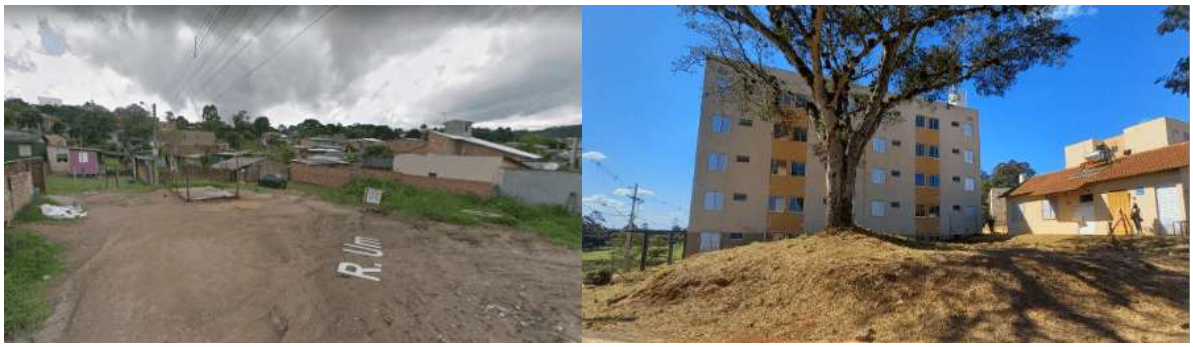

Figure 3. Empty spaces in peripheral regions with a high Social Vulnerability Index (SVI) in Porto Alegre where Urban Terrariums will be established: Maristas Housing Allotment on the left, and Vila Mariante on the right. Source: the author.

The Urban Terrarium Project impacts four major cornerstones: environmental, urbanistic, social, and economic. In the Environmental cornerstone, the project is aligned with the mitigation of greenhouse effect gases and the adaptation of urban areas to counter the adverse effects of climate change. A precondition for establishing the space is following sustainable practices such as: use of building materials, urban equipment and furniture made with ecological materials; planting of native flora; the rational use of water through efficient and/or reusable irrigation systems; use of renewable energy systems; the adoption of ways to reduce the impact of heat island formation, such as green walls and roofs; use of alternative drainage, such as gardens and rain. This criteria is included in the bidding process which demands that a minimum number of points be reached, corresponding to the sustainable practices adopted, as a standard for the project's technical qualification.

In addition, regarding the Environmental cornerstone, Terrariums can be used both as support and laboratory for environmental education. Spaces can accommodate workshops and events about environmental awareness, while the sustainable practices adopted can become explorable models for workshops.

Regarding the urbanistic cornerstone, the establishment of a system of lively open spaces – since activities implemented should be "active", i.e., ensure people's permanence in the areas – terrariums can contribute to urban vitality and safety, fostering principles associated with quality of life and urban well-being, such as walkability, coexistence in open spaces and contact with nature. In this sense, as to the Social cornerstone, terrariums bolster socialization, as well as public space coexistence and the communities' active participation in the creation and management of these public spaces through co-creation, placemaking, tactical urbanism and shared management.

In terms of the economic cornerstone, besides fostering the inclusion of medium-sized and small businesses in central urban areas, the project is linked to the sustainable management of residual spaces through private capital participation and the exemption of management and maintenance costs on the part of the city hall administration through use permits.

3. Ways of implementation

The model of shared management with society anticipates that Urban Terrariums be implemented through two types of partnerships. In Category 1, use permits are costly and implemented by means of a bidding process, allowing commercial use or services at the location. Those interested can implement up to two

activities, one of which should necessarily be “active”. To ensure soil permeability, activities should be placed in up to two closed removable spaces, such as stands or containers, whose size is previously defined by public notice. As a counterpart, the permittee is responsible for implementation, maintenance, and management of the open space, which should have open access to the public.

In this Category, the possible activities that may occur are: food businesses, especially organic products or those for healthy nutrition; services encouraging people’s permanence in the open space, such as those associated with physical activity; activities connected to recreation and leisure in the open space, such as the promotion and production of shows, cultural or artistic events; activities aligned with promoting a healthy and sustainable lifestyle, such as organic food markets, businesses related to plants and gardening implements or landscaping services and projects; other activities fostering environmental sustainability and permanence in the space.

The images below correspond to, on the left, views of areas previously used as parking lots; on the right, directives given by the Sustainability Projects Coordination of SMAMUS for the implementation of the first Category 1 Urban Terrarium.

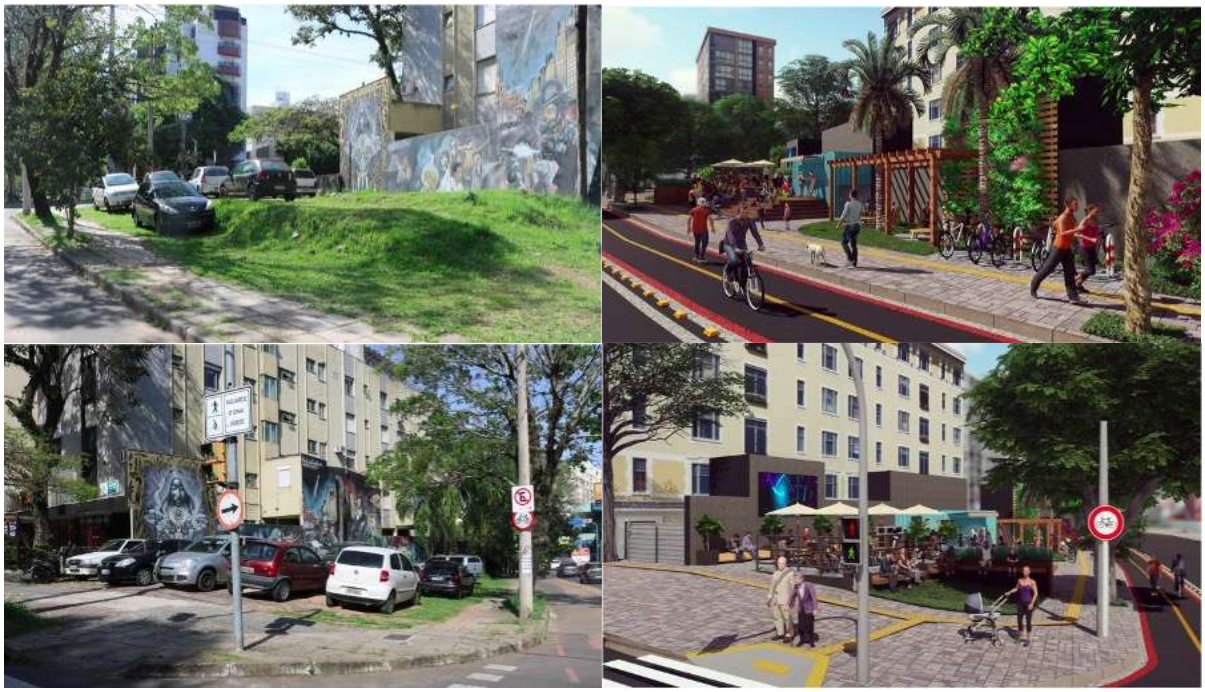

Figure 4. On the left, images of an unoccupied area on Neuza Brizola Avenue, Bela Vista district; on the right, Directives for the Pilot Project Urban Terrariums -Category 1. Source: the author.

4. First Results

The winning bidder is MaçaiX, a medium-sized local business with production and consumption processes based on environmental and social sustainability premises. The main activity to be implemented is the sale of food products derived from and complementary to açaí, fruit of the açaí tree, a tropical palm tree found in its wild state in the Amazon region.

Besides commercial activities, the space now being worked on will have an area with gym equipment, a skatebox - a large box for the leisure and sports practice of skateboarding; a space for pocket shows under

the trees for free presentations; board game tables and relaxation areas under pergolas, and a deck. Building materials will be ecological, floors, permeable; there will be native flora, photovoltaic solar panels and a green wall will be installed, as seen below.

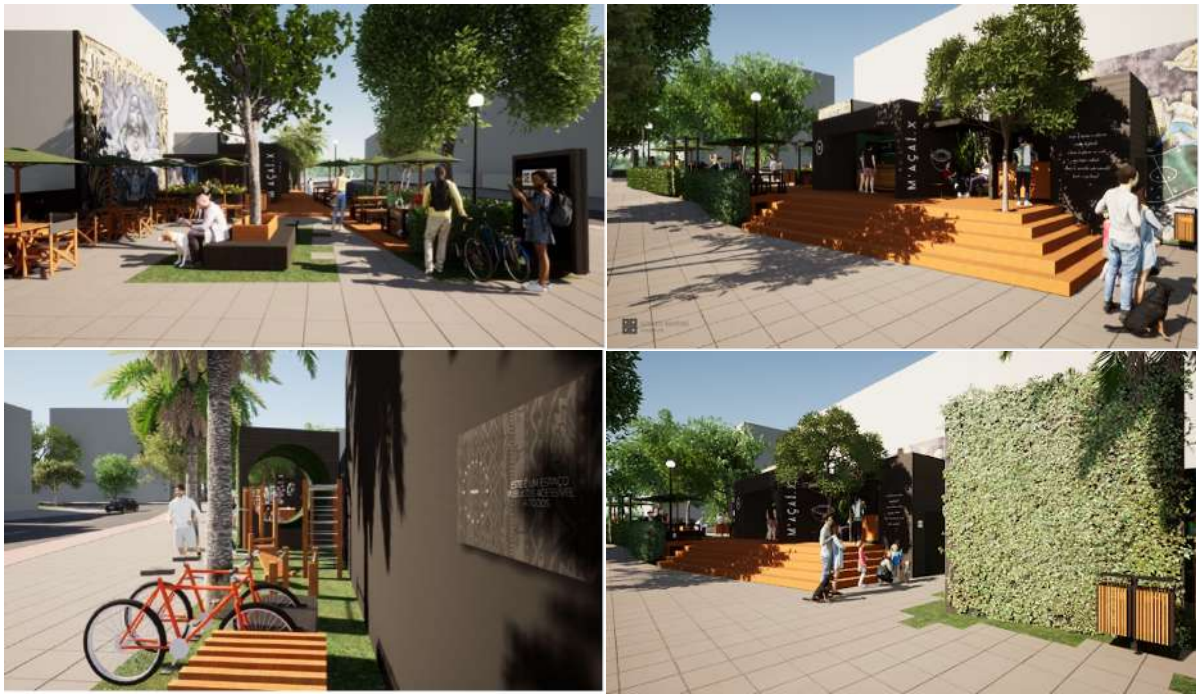

Figure 5. Images of the winning bidder project for the Urban Terrarium Pilot Project in the Bela Vista district, Neuza Brizola Avenue, called MaçaiX Terrarium. Source: the author.

The funds obtained in the Category 1 bidding process mentioned (with onerous use permission) will be directed to the establishment of Category 2 Urban Terrariums (with non-onerous use permission) in peripheral areas with a high social vulnerability index. In this case, projects should be directed exclusively to educational, social, environmental, cultural, and innovative ends, or those relevant to the public interest, i.e., with no commercial use. They should also involve the third sector and the community, who should work for the construction and management of the space together with public administration. Non-onerous use permissions are granted to non-profit institutions, such as NGOs, philanthropic entities, or the local community association itself.

In this Category, areas can contain vegetable gardens or urban microforests, gardening, community living facilities, children's recreational areas, spaces to support, receive and train vulnerable groups, or other activities that promote environmental, social, and cultural sustainability, and encourage permanence in the open space.

An example of this can be seen in an area which is at the moment being co-created: the Senhor do Bom Fim Housing Allotment. The community resettled at this site originally lived in Vila Nazaré; however, this area was needed for extension of the Salgado Filho International Airport runway. Terrarium implementation is being carried out in a joint effort by the Municipal Department for the Environment, Urbanism and Sustainability and the Municipal Department for Housing and Landholding Regularization of the city of Porto Alegre through the Civil Society Organization (OSC – Osicon) in partnership with Coletivo Translab, and anticipates the creation of a community living space. The project's emphasis is social since it intends to serve 347 families in a situation of vulnerability, and events directed towards environmental

education are planned to take place, including vegetable gardens, a senior citizen physical activity area and a community gathering facility.

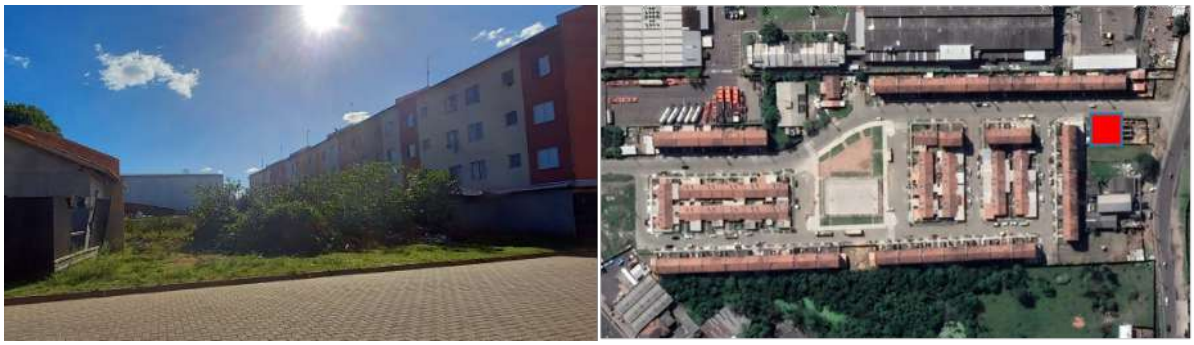

Figure 6. High SVI area in the Senhor do Bom Fim Housing Allotment, marked in red, where an Urban Terrarium will be implemented. Source: the author and Google Earth.

Another example in Category 2 – also being co-created and emphasizing environmental aspects – anticipates the creation of an urban microforest with native plants, a coexistence space with a stage and facilities built with ecological material, an urban vegetable garden, among other ecological practices. Both the project and the creation of the space are directed by the NGO Toda Vida, Coletivo Arquitetos Voluntários (Voluntary Architects Collective), Coletivo Lixo Zero (Zero Waste Cooperative Group), the NGO Green Thinking, the Lappus Institute, Factum College, São Francisco College of Architecture, and the Federal University of Santa Maria, among others. Sponsors include Venâncio Aires Hardware Co., Ecotelhado and Suvinil. The space will also have urban art created voluntarily by artists.

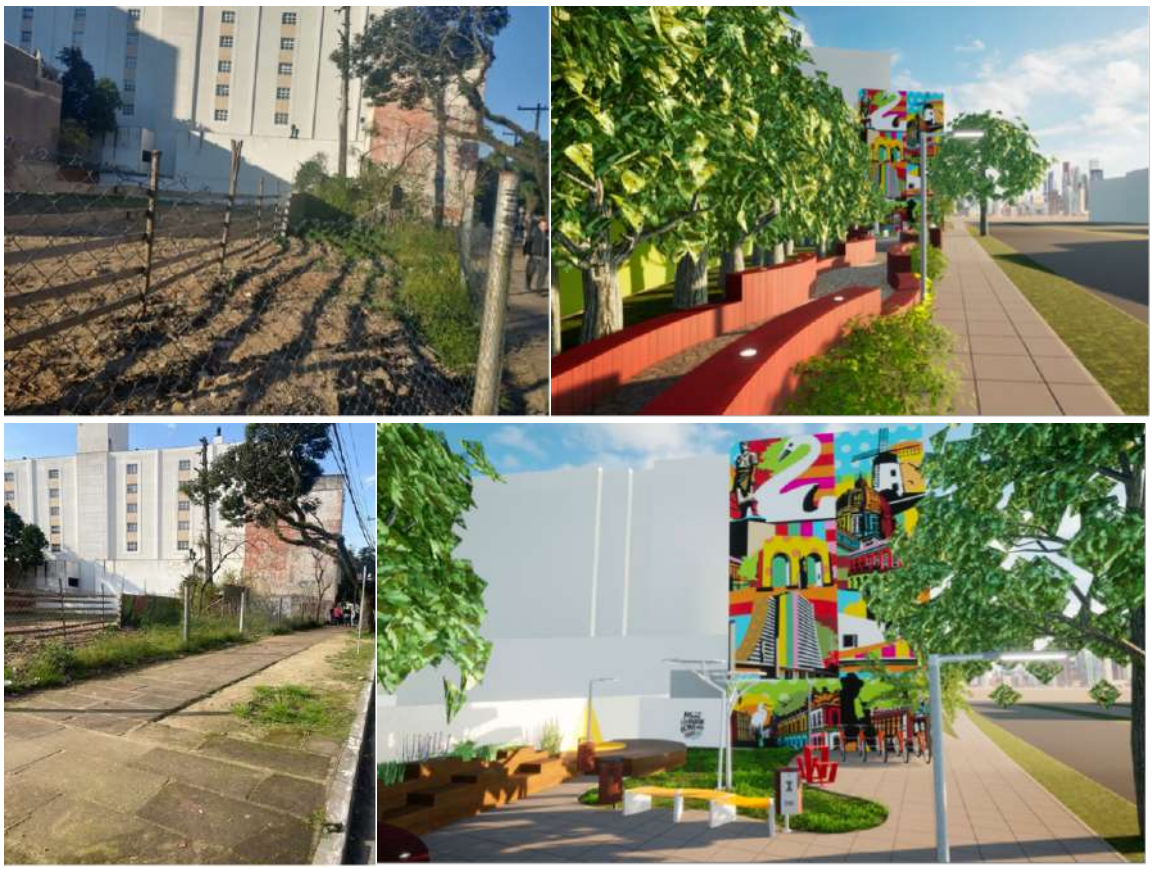

Figure 7. On the left, images of an unoccupied area on Aureliano de Figueiredo Pinto Avenue, Praia de Belas District; on the right, images of the first proposal for the co-creation of the Category 2 Pilot Project, implemented by the abovementioned entities. Source: the author and Voluntary Architects Collective.

After these first experiments, urban terrariums can spread throughout the city on previously mapped areas, both in the consolidated city area and in regions presenting a high Social Vulnerability Index. In this sense, a survey carried out in 2019 by the Heritage Management Department offered 300 residual municipal areas that could be evaluated for feasibility of implementation. In the initial phase of in loco analysis of acceptability, a first survey defined 12 spaces to be submitted to bidding. The survey of informal areas is being processed, with the initial definition of six areas, among which are the two seen in Figure 3.

Especially in these areas – corresponding to Category 2, and an initiative compatible with the idea of upholding human rights and poverty relief – one of the premises is the shared creation, protection, planning, and management of public spaces with the community. The population will participate in the process of creating the project, hence recognizing the needs of those who live and work in the surrounding area, and fostering the feeling of belonging and ownership of the space. This can encourage greater involvement and permanence in that area on the part of the people there, with a reduced risk of vandalism and greater sense of safety.

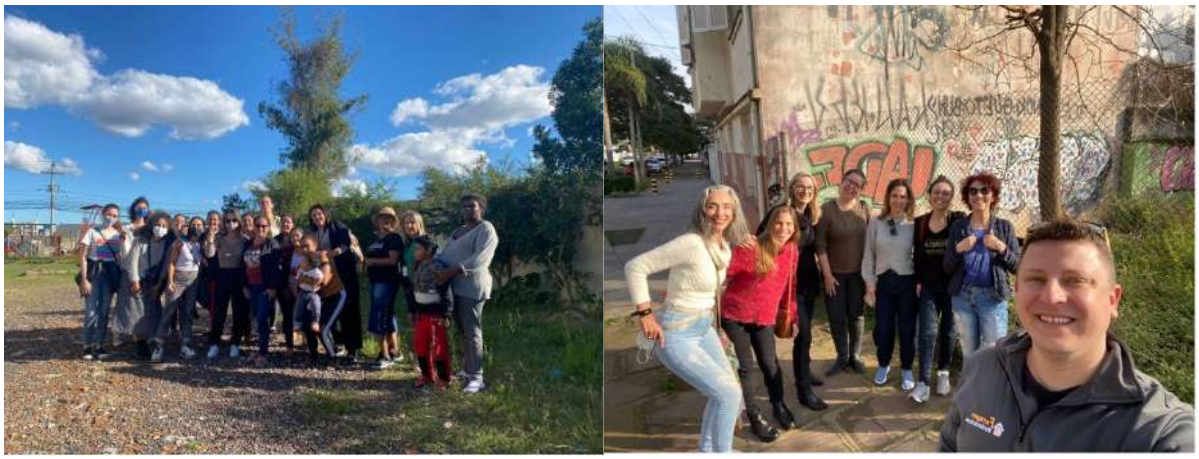

Figure 8. On the left, the Senhor do Bom Fim Housing Allotment community and the technical group involved in the Project. On the right, leaders who participated in the implementation of the Terrarium on Aureliano Figueiredo Pinto Avenue, Bela Vista district. Source: volunteers involved.

5. Convergence with the Sustainable Development Goals (SDGs)

The Urban Terrariums project fulfills premises set by the UN-habitat (2020) concerning the promotion of local policies, plans and projects for safe, inclusive, and accessible public spaces that encourage compact, more integrated, well-connected, socially inclusive, and resilient cities and neighborhoods. The project has the potential not only to positively impact the surrounding population, but the urban system as a whole, by stimulating lively activities and providing accessibility to senior citizens and those with disabilities, thus contributing to climatic resilience.

Among the goals of sustainable development that converge with the project, we can mention especially no. 11: “Sustainable cities and communities”, and no. 13: “Taking urgent action to combat climate change

and its impacts". Regarding goal no. 11, to make cities and human settlements inclusive, safe, resilient, and sustainable, the Urban Terrarium Project proposes to extend access to public spaces (11.1) by adding a new typology – a small and sustainable coexistence area, especially in regions with a high SVI, that urgently need these facilities. It also proposes a holistic and integrated view regarding planning by creating a network of open spaces at the macro territorial level, built on participative and sustainable processes (11.3). By ensuring soil permeability and the inclusion of native flora in areas that are part of the network, the project fosters the protection of the natural heritage (11.4) and offers universal access to safe, inclusive, accessible, and green public spaces, particularly to women, children, the elderly, and those with disabilities (11.7).

In terms of goal no. 13, to combat climate change and its impacts, the Urban Terrarium Project tries to integrate sustainable actions with policies, strategies, and planning (13.2). In this sense, it proposes to use the implementation processes and the area's physical space for environmental education, awareness, and the extension of human and institutional capabilities for the mitigation, adaptation, impact reduction and early intervention in climate change (13.3).

Besides the goals mentioned, goals no. 7. 8. 10. 12 and 17 are also partially fulfilled. As for no. 7, in encouraging the use of renewable energy sources in Urban Terrariums, the project seeks to increase the role of clean energy in the global energy matrix (7.2). As for no. 8, in transforming residual municipal areas into formal regions of higher property value made available for Terrariums, through business models that attract small and medium-sized local businesses, the Project promotes sustained, inclusive, and sustainable economic growth. It also encourages entrepreneurship, creativity, and innovation, as well as the formalization and growth of micro, small and medium-sized businesses (8.3). Through a partnership for construction with the Pescar Institute, the project can accommodate spaces (containers or stands) built in the Terrarium for training impoverished young people so they can later find employment (8.5), in this way reducing the number of unemployed young people, or those with no schooling or qualification (8.6).

As for goal no. 10, to reduce inequality, the Urban Terrarium Project proposes to equalize the distribution of public spaces throughout the territory, providing peripheral areas, or those in need, with terrariums. Regarding goal no 12, to ensure more sustainable production and consumption patterns and attain an efficient management and use of natural resources (12.2), the Urban Terrarium project encourages the adoption of sustainable practices in all processes, making relevant information and awareness available for sustainable development and lifestyles that are in harmony with nature (12.8).

Lastly, in terms of goal no. 17, the Project strengthens local partnerships and extends the systemic view and coherence of policies towards sustainable development (17.4). It encourages the formation of effective public and public-private partnerships, and those with civil society, based on experiences with different strategies of resource mobilization these partnerships have (17.7).

Hence, the project generates benefits to society, public administration, the private sector, and the environment. It contributes to the mental, physical, and social health of users; promotes urban surveillance and safety, and adds to the city's green infrastructure. Through the creation of a network of active urban green spaces, connected at a local scale, the terrariums can offer the city spatial and connective qualities that are crucial to urban sustainability and resilience.

6. References

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