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Housing technical assistance in slums in the Metropolitan Region of Rio de Janeiro: an approach to the issue of water and healthiness of habitat

Assistência técnica habitacional em favelas da Região Metropolitana do Rio de Janeiro: a abordagem da questão das águas e a salubridade do habitat

Asistencia técnica habitacional en favelas de la Región Metropolitana de Río de Janeiro: una aproximación a la cuestión del agua y la salubridad del hábitat

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Abstract

The work that we present brings the record of a winning proposal of the Contest of Ideas and Practices: City, Housing, and Health promoted by the Council of Architecture and Urbanism of Rio de Janeiro in 2020, in which we highlight activities developed in the sphere of Housing Technical Assistance in two slum communities in the Metropolitan Region of Rio de Janeiro, aiming to promote better health conditions in local housing. It is often observed in upgraded slums the permanence of scenery of unhealthy conditions, despite the construction of public networks of water supply and sanitary sewage, since many local dwellings do not have adequate residential hydro-sanitary installations. We believe, therefore, that carrying out technical assistance projects for the promotion of housing improvements associated with upgrading actions in public spaces plays a vital role in improving the built environment – and in this context, the relationship with water plays an important role.

Keywords: Technical Assistance; Social Housing; Habitability in Informal Settlements.

Resumo

Urbanismo do Rio de Janeiro, em 2020, no qual destacamos atividades desenvolvidas na esfera da Assistência Técnica Habitacional em duas comunidades faveladas da Região Metropolitana do Rio de Janeiro, visando promover melhores condições de salubridade em moradias locais. Observa-se, muitas vezes, em favelas urbanizadas, a permanência de um quadro de insalubridade, apesar de terem sido implantadas redes públicas de abastecimento de água e de esgotamento sanitário, pelo fato de muitas moradias locais não possuírem instalações residenciais hidrossanitárias adequadas. Acreditamos, portanto, que a realização de projetos de assistência técnica para a promoção de melhorias habitacionais, associada às ações de urbanização nos espaços públicos, cumprem um papel relevante na melhoria do ambiente construído – e nesse quadro, a relação com as águas cumpre um papel fundamental.

Palavras-chave: Assistência Técnica; Habitação Social; Habitabilidade em Assentamentos Informais.

Resumen

El trabajo que presentamos trae el registro de una propuesta ganadora del Concurso de Ideas y Prácticas: Ciudad, Vivienda y Salud promovido por el Consejo de Arquitectura y Urbanismo de Río de Janeiro, en 2020, en el cual destacamos actividades desarrolladas en el ámbito de Asistencia Técnica de Vivienda en dos favelas de la Región Metropolitana de Río de Janeiro, con el objetivo de promover mejores condiciones de salud en las viviendas locales. Es frecuente observar en los barrios marginales urbanizados, la permanencia de un cuadro de condiciones insalubres, a pesar de la implantación de redes públicas de abastecimiento de agua y alcantarillado sanitario, debido a que muchas viviendas locales no cuentan con adecuadas instalaciones hidrosanitarias domiciliarias. Creemos, por tanto, que la realización de proyectos de asistencia técnica

para la promoción de mejoras habitacionales, asociadas a acciones de urbanización en espacios públicos, juegan un papel importante en la mejora del entorno construido – y en este contexto, la relación con el agua juega un papel importante.

Palabras clave: Asistencia técnica; Vivienda social; Habitabilidad en asentamientos informales.

Introduction

The work we present herein brings the report of a proposal winning in the competition of ideas and practices, promoted by the Rio de Janeiro Architecture and Urbanism Council (CAU–RJ): City, Housing and Health, in the Housing Defense category as a health promotion, in which we highlight activities developed in the context of Housing Technical Assistance, in two slum communities in the Metropolitan Region of Rio de Janeiro: Rocinha (Rio de Janeiro, RJ) and Morro do Palácio (Niterói, RJ). In the projects developed in these two communities, families were indicated by the Rocinha Without Frontiers group (partner in proposal for the competition) and by the Association of Residents of Morro do Palácio for the development of the works. The houses selected should represent the housing situation in these communities to allow dissemination of the solutions adopted with the other residents through the projects carried out. In both cases, studies were developed to reform and extend existing housing. Throughout the project preparation process, discussions were held between the team and the families involved to define needs, available resources, and implementation steps. After the projects were completed, they were made available to the residents. In both cases, the projects were designed to promote better ventilation, lighting, and insulation conditions, thus enabling better health conditions in these housing units. Finally, the work developed for the competition proposed elaborating graphic material containing guidelines in a manual or booklet format, which could disseminate appropriate technical solutions for other housing improvements in Rocinha and other communities. Thus, families whose houses presented similar problems could access and reproduce this information.

With these projects of Housing Technical Assistance, carried out within the context of the University Extension, we intend to contribute, in addition, with subsidies for the implementation of actions carried out by the public authorities aimed at promoting the improvement of living conditions in shantytowns in the Metropolitan Region of Rio de Janeiro, thus reaffirming, the role of the Public University in building a more socially fair and, consequently, more democratic city. The relationship between architecture and health is increasingly evident in the perspective of building a healthy habitat – we adopt the concept of urban habitat that "is situated in housing but covers all infrastructure and services that make up the intermediation between individualized living (housing activity of the

family group) and the collective (urban interrelations)," according to Carlos Nelson Ferreira dos Santos (1988).

Finally, in this work, we highlight, within the set of planned actions, the proposal for the implementation of technically adequate hydro-sanitary installations, aiming at the rational use of water distributed by the public network, avoiding losses and situations of contamination. The projects also propose using rainwater for reuse in less noble functions, such as floor washing, toilet flushing, and watering plants. It is believed that the dissemination of solutions like this in technical assistance projects for the promotion of housing improvements in informal settlements could contribute to a significant reduction in the consumption of treated water, in addition to proposing solutions aimed at ensuring more excellent permeability of land – whenever possible –, aiming to reduce contributions to rainwater networks. Finally, it is worth remembering that occasional interventions in housing, associated with urbanization actions in public spaces paving, drainage, sanitation infrastructure -play an essential role in improving the built environment, in which the relationship with water has an important character.

We then presented, initially, a brief discussion about this relation and the role of the Housing Technical Assistance of Social Interest (Athis) and then showed the results of the experiences carried out in these two informal settlements in the Metropolitan Region of Rio de Janeiro, contained in the material contemplated by the competition promoted by CAU-RJ.

Architecture, health, and technical assistance

The relationship between architecture and health, especially regarding housing, was evidenced in 1980 by several authors, among whom we highlight the works of Simone Cohen (2007) and Suzana Pasternak (2016). In Brazil, we emphasize the constitution of the Brazilian Network of Healthy Housing (RBHS) in the early years of 2000. At that time, at Rocinha, the consequences of the precarious health conditions of the built environment were also observed in the records of the local Municipal Health Center (CMS), with the observation of a large number of care services related to respiratory diseases: "Not only because of the climatic characteristics of the neighborhood but also because of the location conditions of the dwellings (houses without ventilation, without permeability of sunlight, [. . .] and the form of family concentration in these houses, most of which are houses in subnormal agglomeration". The third largest pediatric care, in turn, was aimed at the treatment of skin infections caused by the lack of basic sanitation, with the overflow of ditches in rainy seasons, leading to an increase in cases of hepatitis A and leptospirosis (Butler; Carneiro, 2000).

As in Rocinha, in several other slum communities with a high housing density, the same problems were observed. Regarding the confrontation of the frequent respiratory issues of residents, Maria Helena Carneiro – nurse and director of

the CMS of Rocinha – points out the primary strategy adopted: the implantation of the family doctor character; The division of the community into 25 areas, each attended by a team made up of a doctor, nurse and six community agents (Rocinha's dwellers). With this action, the cure rate rose from 66.1 percent in 2001 to 81.2 in 2013, occurring, similarly, the reduction in treatment abandonment, thanks to the follow-up performed by the teams. Although the results are positive for cure rates, prevention still needs more attention.

In her work, the director of CMS associates tuberculosis prevention with the necessary community urbanization, with the implementation of basic sanitation infrastructure, as well as interventions in the community's road network to promote significant improvements in habitat quality. Maria Helena Carneiro, in an interview in 2015, gives an example of the impact of these urban interventions on the promotion of community health: the enlargement of Rua 4 – one of the main roads of the community, which initially had an average width of 1.00 m, with buildings of two, three and four floors. This sector of Rocinha concentrated the most significant number of tuberculosis cases in the whole community. After the execution of the enlargement works of this road – which included the set of urban interventions implemented by PAC-Slums – completed in December 2010, the number of cases of tuberculosis in this area reached zero, highlighting the meaning of the habitat, especially the housing conditions, guaranteeing adequate health conditions for the residents (Betim, 2015).

Figure 1: Protest highlighting sanitation: yes! Cable car: no; invitation to inhabitants take part in meeting about flooding with city councilor, both in Rocinha and with the participation of the Local Organization "Rocinha Sem Fronteiras". Source: Authors.

This specific intervention, in a community with 100,000 inhabitants, could not alter, however, the profile of the propagation of respiratory diseases in the community due to the characteristics of the local urban morphology. The Covid-19 pandemic, in turn, has deepened this scenario – the lethality rate for the new coronavirus is more than double in neighborhoods with high concentrations of slums when compared to communities without the presence of informal settlements, according to the information contained in the Socio-epidemiological Bulletin of Covid-19 in the slums, published by the Oswaldo Cruz Foundation, in 2020.

In this document, the absence of a "quality public policy that supports collective protection" is emphasized, and healthy housing is considered fundamental in a health promotion policy, considered one of the main objectives of the Brazilian Network of Healthy Housing (Cohen et al., 2007). As for the pandemic, it is also essential to resume the work of Suzana Pasternak (2016), as it highlights, among other factors, the significant amount of time that is spent at home, especially children and older adults, the most vulnerable. With the new coronavirus, even as one of the main preventive measures, staying at home has become advisable for all, thus reinforcing the role of housing.

Therefore, a clear understanding of the role played by housing in the construction of a health promotion policy is observed, and, in this sense, Technical Assistance for Housing of Social Interest is of greater relevance since, in addition to the interventions promoted in the context of public space in informal settlements, those carried out within the framework of the private space – housing – will have a complementary and fundamental character in improving the general conditions of the built environment and, consequently, the health of the residents of these communities. Thus, we believe that public policies aimed at creating unique lines of financing construction materials, associated with technical advice promoted by civil architects, engineers, and professionals from other areas, would play a relevant role in solving a set of health problems observed, often in shantytowns. Finally, we emphasize that these actions must be built through permanent dialog with residents and the different community representations – an interaction between technical knowledge and widespread knowledge.

Ideas and Practices Competition: City, Housing, and Health

The Ideas and Practices Competition: City, Housing and Health, held in July 2020, was organized by the Technical Assistance Commission in Housing of Social Interest of the Architecture and Urbanism Council of Rio de Janeiro due to the COVID-19 pandemic. In carrying out this competition, part of the resources already earmarked for ATHIS actions in 2020 was used, which already showed a previous concern about the valuation of technical assistance. Ten projects were awarded, eight in the "Defense of the Territory as Health Promotion and Social Welfare" category and two in "Housing Defense as Health Promotion."" Each selected proposal received R$ 10,000.00 (ten thousand reais) to be invested in actions to combat the new coronavirus.

The result of the competition demonstrates a necessary prevalence of collective actions in the search to promote the control of the spread of the Covid-19 pandemic. We focused, in our work, on a proposal focused on housing improvements as one of the strategies for coping with this health framework – the other award-winning proposal, in the same category, focused on the qualification of collective care spaces of Manuel Congo occupation, in the central area of the city of Rio de

Janeiro. The project we introduced, having as a partner a Local Non-Governmental Organization, in addition to seeking to enable a better quality of life for the selected families – through the development of specific interventions in the residences – also intended to stimulate the dissemination of these actions.

This dissemination of appropriate technical solutions, to be carried out by the NGO, is aimed to present alternatives to face one of the main problems of the Rocinha community: the high incidence of tuberculosis and other diseases associated with inadequate ventilation and insulation of the compartments. The precarious living conditions in the community still put the local population at risk, especially regarding the possibilities of contamination by the new coronavirus, a situation aggravated by the small size of the compartments and the large number of residents.

Before we go deep into the experiences of ATHIS that set up the practices presented in the project awarded by the competition, it is necessary to point out the difficulties faced in the second semester of 2020 to start the work. Meetings were held at a distance, with the participation of the team members, aiming at the approach of the work schedule; the increase in the number of cases of Covid-19 in the Rocinha was verified. As this was a proposal for the development of specific projects in the selected houses, which would require the carrying out of surveys in these dwellings, it was concluded that it would be necessary to suspend, momentarily, the field activities. Several factors led to this decision: the suspension of academic activities in the presence of students and professors in these field surveys; several members of the NGO were part of the group characterized as a risk by health authorities; and finally, the impossibility of participation by municipal health agents who work in the community, in the realization of photographic documentation of the selected houses.

Experience of technical assistance in two slums of Rio de Janeiro – Rocinha and Morro do Palácio

The first technical assistance action presented in the competition brings an experience promoting housing improvements in the Rocinha slum, located in the Southern part of Rio de Janeiro, with approximately 100,000 inhabitants. It is one of the largest slums in the country, situated on a hillside area, with a highly dense occupation. Based on a case study – a residence located in an alley crossing Rua 4 (one of the central communities) –, the group sought to develop solutions that meet the needs and demands of the resident – indicated by a non-governmental organization – considering the existing availability of resources for the execution of the planned works. Thus, the team carried out the necessary surveys to characterize the existing building, which would be the object of the proposed intervention. It was a building purchased by the resident, who had been closed for years, presenting a rather precarious state of conservation. During the discussions with the team, the project's solution was elaborated, which proposed

an evolutionary residence. Thus, from a ground-floor unit – which would be occupied immediately – two new independent units for renting would be built later, as requested by the resident.

Figure 2: Survey (House on the left, slab of the house and surroundings) and discussion of the project between team and resident in Rocinha. Source: Authors.

The proposed housing typology, which has an area of 27 m² of private space per floor, consists of a bedroom, living room, bathroom, and kitchen – a frequent solution in this slum in the Southern region of Rio de Janeiro, due, among other factors, to the highly reduced terrain dimensions. In turn, the solution for the terrace – with a small warehouse, toilet, service area, barbecue, and free area covered and uncovered – seeks to contemplate the recreation and conviviality of the residents, which usually occurs in the terrace slabs of the buildings in the community. The project thus aims to establish a dialog with the constructive practices of Rocinha's residents, seeking to introduce technical solutions that make it possible to improve the conditions of lighting, insolation, and ventilation, considering the singularities of the site in question – an area with buildings of 3 and 4 floors on a narrow path. Cross-ventilation, the use of latticework, and adequate sizing of frames using construction materials commonly used by residents are some of the proposals to promote improving living conditions in this new building.

In this project, special attention was given to the issue of proper execution of hydro-sanitary installations following good techniques, particularly in connection with the public supply network, to avoid situations that could generate contamination of the collected water. The preliminary study's detailing predicts the capture of rainwater through gutters and an upper reservoir intended explicitly for this purpose, aiming to meet the consumption of toilets, washing floors, and watering plants. In periods of drought, the main reservoir will fulfill this function.

Figure 3: Illustrations of the project and its insertion in the surroundings. Source: Authors.

The second experience of technical assistance carried out by the team and presented in the competition, City, Housing, and Health, took place in the Morro do Palácio community, in the Ingá neighborhood, in one of the most valued areas in Niterói. It was also an occupation in a hillside area, but less dense than that observed in the Rocinha community. The contact with the resident whose residence would be the object of a project was made through an indication of the Residents Association, according to the criteria of representativeness of the housing situation in the community. The residence in question was situated close to one of the accesses of the community on a steep and paved street. The land on which the house is located has a slope and is seated on a plateau in the front part of the land. The original residence was composed of two bedrooms, a living room, a kitchen, and a bathroom, having a ceiling height of 2.40 m and insufficient window openings to ensure adequate ventilation and lighting.

Already in the first meeting, the resident presented his demands: the new construction should house three bedrooms (two en-suite bathrooms – one for the couple and one for the 16-year-old son, with special needs), a room for the two children of his partner, kitchen, bathroom, and a parking space. The new residence and its surroundings should guarantee full accessibility conditions, considering the special needs of the older child. The resident would execute the

work, and execution should be planned in stages according to the possibilities of family resources. Finally, the bathroom in the house was requested not to be demolished since it already had reinforced concrete structure finishes and had been recently constructed.

Based on this demand, the group developed a first study, presented to the residents through floor plans and an architectural physical model – a relevant instrument for the complete understanding of the proposed project. The new solution is developed on a single floor. It has been considered principles of environmental comfort to promote better ventilation and lighting conditions and address the accessibility issues presented at the meetings we held. This first study was the subject of consideration by the residents, who, although satisfied with the solution offered, requested the prediction of a roof terrace, whose access should be independent, housing a recreation area for the family and a more expansive space of service.

Figure 4: *Plot and house location; self-constructed bathroom highlighted; and presentation of the architectural model on site. Source: Authors.*

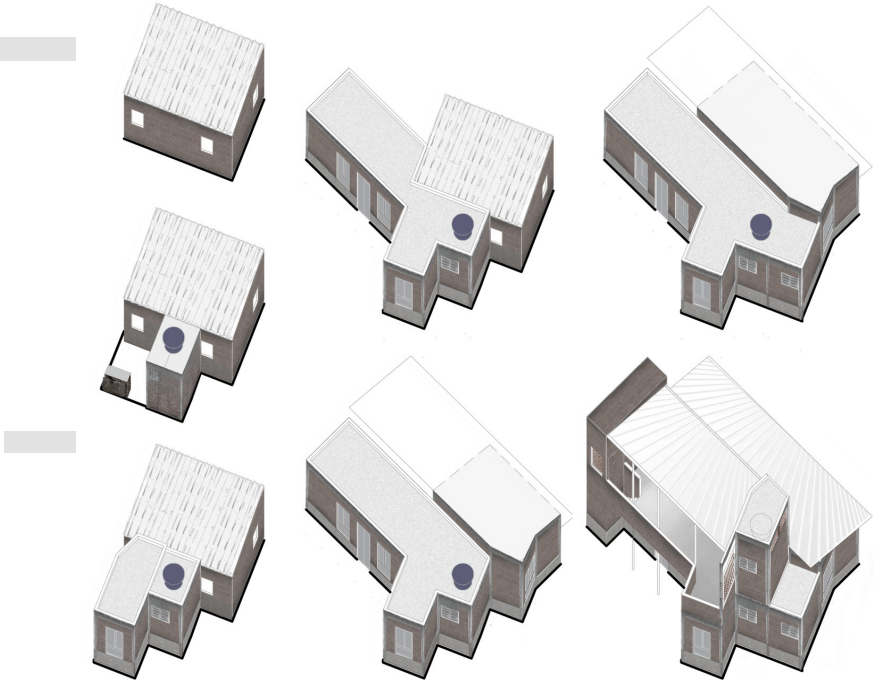

Figure 5: Phases of housing development. Source: Authors.

From these new demands made by the residents, the team developed a second study, in which the original program was maintained, with the insertion of the roof terrace requested. As presented in the previous project, the solutions to ensure better performance regarding thermal comfort and guarantee satisfactory accessibility conditions were maintained. The construction system adopted is the one most usual in the community: reinforced concrete structure, prefabricated slab, and ceramic sealing bricks. It should also be emphasized that adopting this conventional constructive system considered the resident's familiarity with this technique since the family and neighbors would execute the work. On the other hand, the availability of these materials in building materials stores in the community facilitates transportation. It allows access to informal credit in purchases made – something frequent in informal settlements. The project also aims to, like what happened in the proposal presented in Rocinha, dialogue with the vernacular architecture present in the existing buildings in Morro do Palacio, offering, however, a more elaborate composition solution, which intends to contribute with new references to the residents of the community.

The interventions in the scope of technical assistance highlighted in this work constitute significant enlargements, one vertical and the other in phases. Determined by the sites they are inserted, they have different constraints and degrees of complexity. In the first case, the housing in Rocinha, the densification, and practices, such as the use of eaves over the circulation or other lots for private area gain, were factors negotiated to meet the needs of the residents and avoid negative impacts on the surroundings, aiming to, always, to ensure good conditions of insolation and ventilation for their housing, accessed by a narrow crossroad.

Whereas in the project at Morro do Palácio, the proposal started from the premise of execution in phases, combining the spaces designed with the existing ones so that the residents could continue in their house throughout the process of the work execution. The two projects sought the adoption of solutions that could be replicated to serve as a positive reference for other residents of both communities. In addition to seeking to contribute to promoting the improvement of the quality of life of the residents of these housing units, one of the objectives of the development of these two projects was to stimulate the diffusion of appropriate technical solutions to cope with a set of health problems, present in almost all the houses of these two communities. This precariousness of habitability conditions can be mainly observed in the Rocinha slum, expressed in the high incidence of tuberculosis cases and other diseases associated with inadequate conditions of ventilation and insolation of the compartments, resulting from the increase in occupation and verticalization of the existing buildings in this community. More recently, the precarious housing conditions in these communities have also put the local population at risk in particular, especially concerning the possibilities of contamination by Covid-19, both by the size of the compartments – and the large number of residents occupying the houses –, either by compromising the conditions of ventilation, lighting, and insolation, associated with poor water supply and sanitary exhaustion conditions.

As in the proposal developed in Rocinha, the issue of hydro-sanitary installations was also the focus of special attention, with the same design parameters having been adopted, including the capture of rainwater. There was also a concern, in this case of Morro do Palácio, to promote the vertical expansion of the house, thus avoiding horizontal expansions in the land located in a hillside area, proposing the vegetation cover of this free area – which ensures more excellent permeability of the soil –, as well as the execution of drainage gutters, which allows the adequate drainage of the rainwater not captured, to properly direct them – without causing erosion in the existing slope –, to the public street downstream.

A final point to be considered – but no less relevant – concerns the necessary dialog to promote technical assistance in settlements involving technicians and residents. There are standard practices of the residents in constructing their residences, such as opening gaps to neighboring lots. Another constant practice – mainly observed in the Rocinha community – is the execution of increases in the upper floors, which project on the public highway, compromising, even more, the already precarious health conditions of the habitat. In this case, the dialog with the residents in the search for alternative solutions can be pointed out as a possibility of overcoming this problem – which must also count on the action of the public authorities to promote the monitoring of the use and occupation of the soil, based on simplified and agreed urban legislation with local community representations.

Final considerations

To promote the integration of informal settlements into the so-called official city, starting from the re-democratization of the country in the decade of 1980, the projects of slums urban development by the State in the slums of the city of Rio de Janeiro focused as a priority, on interventions in the public space: construction of basic sanitation, paving, and drainage infrastructure, besides the execution of slope containment works and the resettlement of families occupying areas considered to be at risk. Community facilities were also built to support social promotion programs.

Interventions in the private space – in housing – to promote the improvement of housing conditions were not part of the scope of the main urban development program of slums, the Slum Neighborhood Program. Therefore, the permanence of unhealthy conditions was often observed in communities where public water supply and sanitary sewage networks were implemented. Several houses did not have residential hydro-sanitary facilities following good technical standards. Likewise, problems in the execution of structures and the existence of compartments without adequate lighting and ventilation contributed to the maintenance of precarious conditions of habitability and the very safety of residents.

Given this scenario, it is therefore essential to recognize the necessary incorporation of technical assistance actions for housing in urbanization projects for informal settlements so that more satisfactory results can be achieved in

improving the habitat's general conditions. In this context of technical assistance, focusing on the correct execution of hydrosanitary installations and their connection to the public network is particularly relevant for what it represents in preventing waterborne diseases. Considering the singularities of each community, the possibility of introducing the consumption of collected rainwater for less noble purposes – washing floors, watering plants, and, above all, flushing toilets – should also be considered – thus reducing the volume consumed of treated and expensive water. It should also be added that it is essential to address the issue of drainage inside the lots, especially in less densely populated slums, where adequate solutions must be sought for the disposal of these waters, seeking to ensure more excellent permeability of the soil, to avoid saturation of the public drainage networks.

However, the recognition of the necessary incorporation of technical assistance actions to the urbanization projects of informal settlements persists. It can be assumed that the absence of expressive political visibility of these actions may have determined the little interest of public managers in their implementation. There are no openings to be unveiled by the mayor or the Governor for works in the construction of a bathroom in Mrs. Maria's house or the elimination of an infiltration in the walls of José's house. However, the promotion of technical assistance in the follow-up of improvements in housing units in informal settlements will contribute significantly to maximizing the reach of sanitation infrastructure works implemented in urbanization programs, as well as will reduce considerably the health problems of the population that occur due to the precariousness of housing conditions in these settlements. In conclusion, the work presented, within the limits of a small set of specific interventions in Rocinha slum housing in the city of Rio de Janeiro, intends to add to the efforts made by those and all those who intend to transform Law 11.888 into concrete actions in the daily lives of residents of informal settlements in Brazilian cities.

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