

## SUSTAINABLE ATHIS KIT: A FIGHT AGAINST THE SYMPTOMS OF UNHEALTHY HOUSING



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### ABSTRACT

In order to combat the symptoms of housing insalubrity - such as respiratory diseases, mental health, bacteria, mosquitoes among others, the Catalogue - "ATHIS Sustainable Kit" - is developed in order to combat the pathologies of sick houses including health strategies and Energy Transition. A remedy to mitigate these dwellings built without the help of architects or engineers. Families who always use the resources of the SUS or the Public Defender's Office again, with solutions that we must take the lead. Pilot phase from a perspective of reproduction of escalation, complying with the SDGs, especially number 1 – The Fight against Poverty. Political-administrative strategy for better budget allocation aiming at a leading role in Social-Economic, Environmental and Health impact.

**Keywords:** Public Health. Energy Justice. Building Regulation. Cyclical Economy. Urban Equity.

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## INTRODUCTION

### RESEARCH RELEVANCE

A total of 82% of constructions in Brazil do not have the help of specialized technical professionals such as architects and civil engineers (Datafolha Survey at the service of the CAU/DF, 2015).

Brazil is currently experiencing a huge housing deficit. "25 million precarious housing requires constant mass action" (SOMEKH, 2023) – rising to 26 million, according to the João Pinheiro Foundation, 2024. At least 30% of these dwellings are in conditions of building regulation. (CAU/SP, 2022).

Minha Casa Minha Vida Program (PMCMV) with the value ranging between R\$ 190 thousand and R\$ 350 thousand, the unit, as an interstate policy. Emphasizing here our history of urban exile, due to exclusionary housing policies that do not agree with sustainable models of urbanization, involving the "right to the city" (LEFEBVRE, 1991).

Waste of time and funds with the SUS and the Public Defender's Office (Health and Justice) in cases that could be solved or only present solutions with the actions of ATHIS. As is the case with respiratory diseases: "a tuberculosis hospitalization costs 30 thousand reais for the state, 30 thousand reais is a new reform! And the person is medicated, he and his family suffer again from these diseases – which are viral – because the house is sick." (HOLZMAN, 2023).

Aggravating housing insalubrity. According to the Brazilian Institute of Geography and Statistics (IBGE), 5.7 million Brazilians do not have a bathroom at home (NUNES, 2023).

Construction is responsible for 38% of global carbon dioxide (CO<sub>2</sub>) emissions, which contribute to increasing the harmful effects of climate change, according to the 2020 Global Situation Report for Buildings and Construction, prepared by the United Nations (UN) environmental agency.

Figure 01: The Inhabiting and the Encounter. Capão Redondo SP, 2022



Source: Authorial Photography – Móbile Magazine#25 – COTIDIANO, 2022



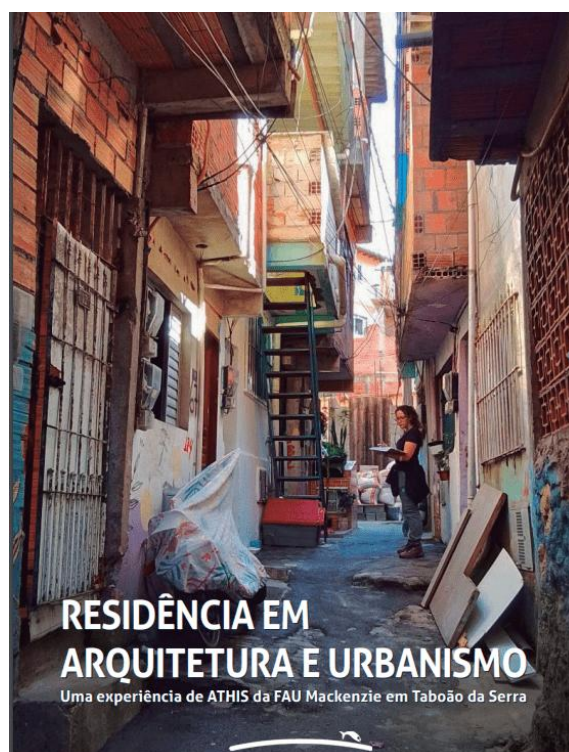
## RESULTS OF THE TECHNICAL RESIDENCY

The design proposal and outcome of this work is reflected from an immersion in the "Trianon", known as "Favela Nova Esperança". Precarious nucleus in Taboão da Serra, in the metropolitan region of São Paulo, bordering the outskirts of the capital. Compared to a "national Hong Kong", such housing density, the experience was provided by the Extension Course "Residency in Architecture and Urbanism: Technical Assistance for Social Housing (ATHIS)".

Its scope was the theoretical-practical training of architects and urban planners, working directly in the Municipality of Taboão da Serra (PMTS) in contact with the municipal policy of ATHIS in housing improvement. Therefore, it is carried out by UPM (Mackenzie Presbyterian University), with support and a partnership with the CAU/SP (Council of Architecture and Urbanism of the state of São Paulo).

"The technical residency carried out by the Mackenzie Presbyterian Institute and the Municipality of Taboão da Serra focuses on Technical Assistance for Social Interest Housing (ATHIS), contributing, therefore, to the dissemination and application of Law 11.888/2008, fundamental to low-income families who lack public and free technical assistance for the design and construction of social interest housing" (OTONDO, 2023).

Figure 02: RESIDENCY IN ARCHITECTURE AND URBANISM: An experience in ATHIS at FAU Mackenzie in Taboão da Serra.

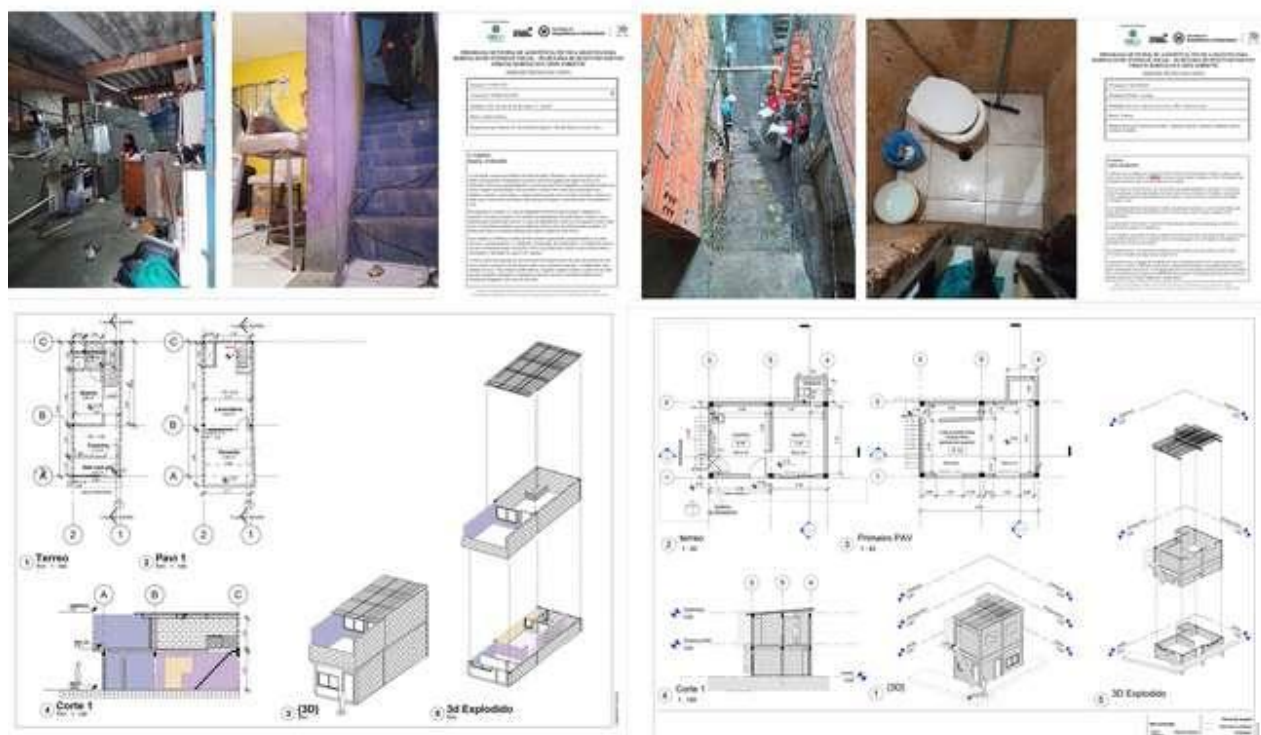


Source: Authorial Photography – Editora TERRA REDONDA, 2023.

## METHODOLOGY – TECHNICAL RESIDENCY

After theoretical classes and analysis in four fundamental themes for the planning context: (1) the conditions of the Green and Blue Infrastructure, (2) the urban legislation, (3) the physical-social characteristics of the territory and (4) urban mobility, the "Housing Survey and Analysis Methodology" was addressed, made possible by the access to the residences whose administrative processes were opened in the field survey stage (32 houses surveyed and enrolled in the Morar Program Better), the "threshold inwards" analysis was carried out, with the objective of studying the characteristics of each construction. Together with PMTS Social Workers, the methodology to make this identification involved: **(i)** the Diagnoses contained in the Technical Opinions, **(ii)** the Photographic Reports and **(iii)** Physical and Virtual Surveys developed in our EATHIS at UPM – technical drawings in traditional CAD mode and with BIM technology.

Figure 03: Housing Survey and Analysis Methodology.



Source: authorial production and collection of the Technical Residency, 2023.

## CONSULTATION OF SCIENTIFIC CONTRIBUTION

Next, the "Identification Table – Pathology by prioritization" is developed. Scientific contribution generated from the Methodology mentioned above. This stage was carried out through the identification of pathologies and classification of the degrees of housing

[illegible]

### OBJECTIVE/DESIRE FOR INTERVENTION

The house below, represented in the Sketch (Figure 06), went through our entire "Housing Survey and Analysis Methodology" - it was identified as the house with the highest degrees of precariousness, following the evaluation criteria of the technical architects involved. It can be identified in the Table in Figure 04, with most of the pathologies identified as red. Located in an area subject to Land Regulation, therefore, a good example for the experiment of implementation of the KIT. Bearing in mind that each house is different, there will be residences that demanded attention and priority of treatment – of some utensils listed here – more than others.

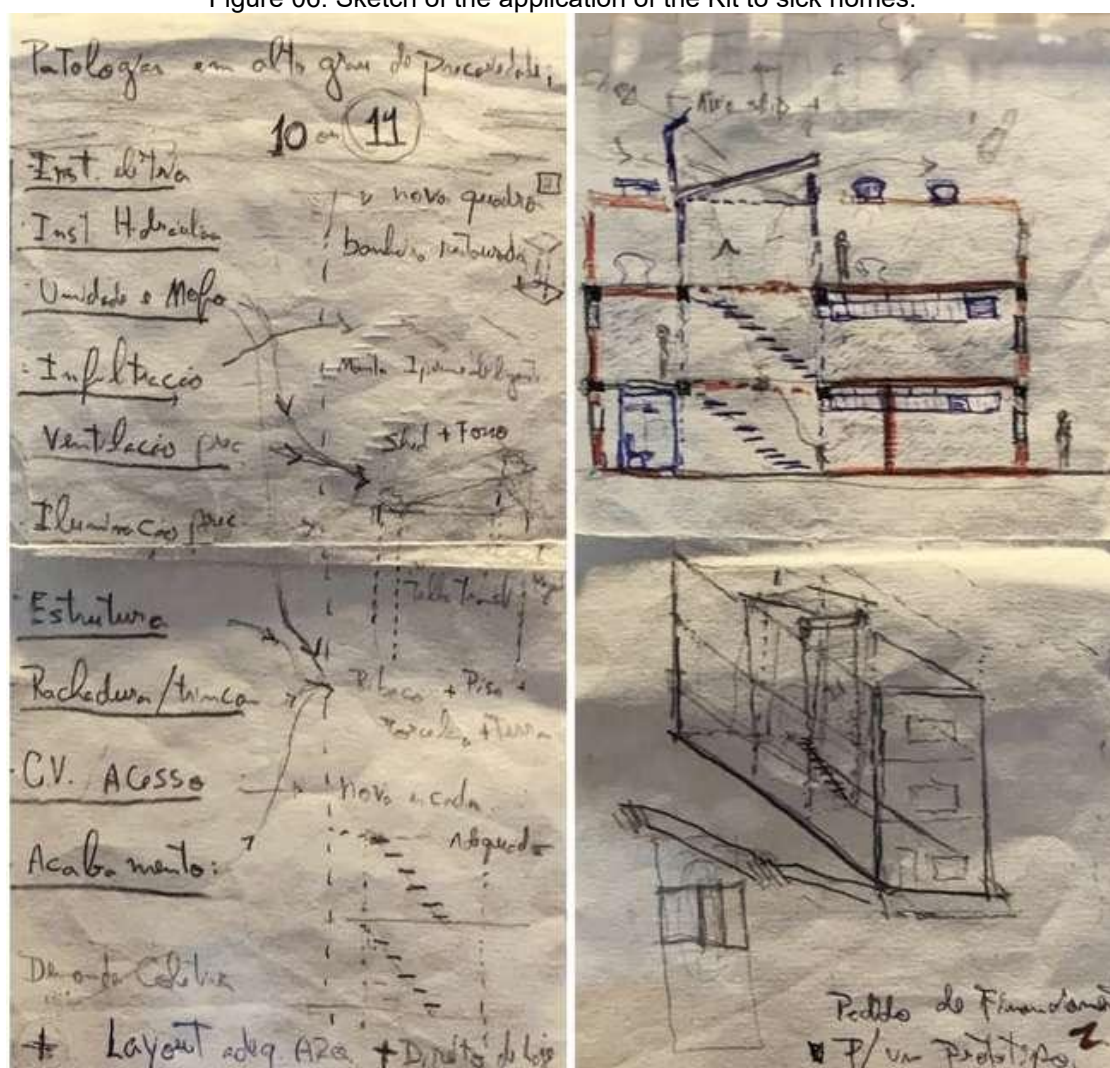


Figure 05: House 3.



Source: Technical Residency, page 247, 2023

Figure 06: Sketch of the application of the Kit to sick homes.



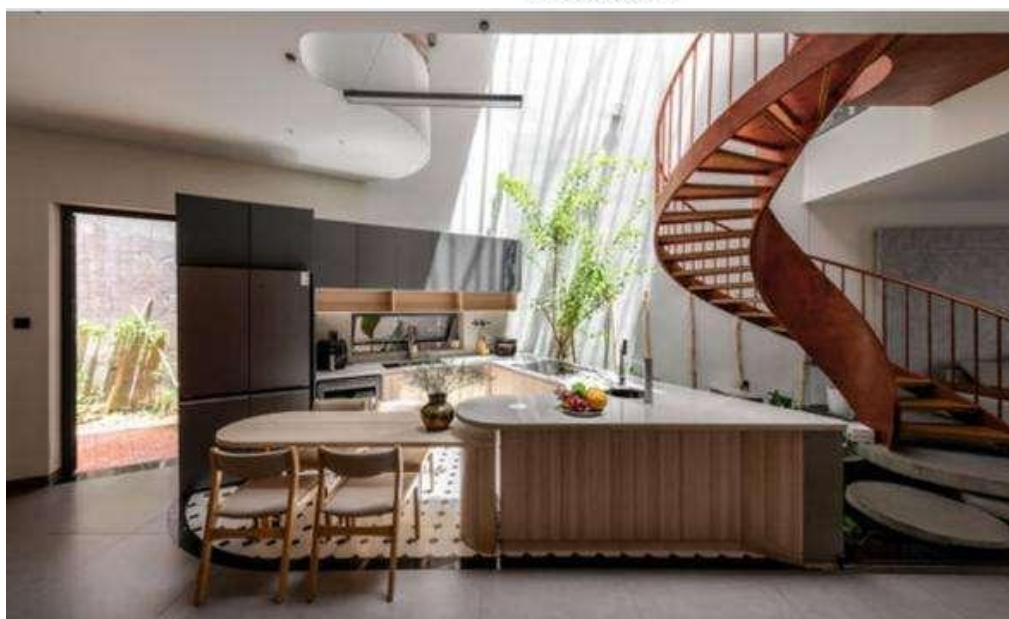
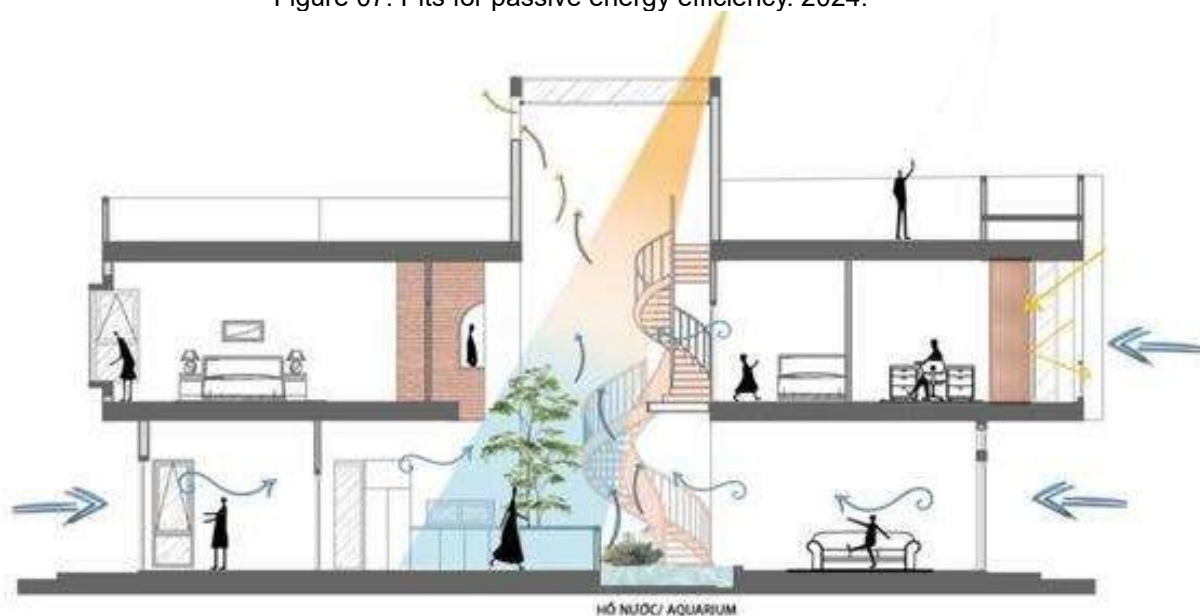
Source: Authorial production through residency, 2023.

## COMBATING UNHEALTHY HOUSING, BUILDING REGULATION AND TERRITORIAL ADAPTATION

In order to combat the symptoms of housing insalubrity - such as respiratory diseases , mental health, bacteria, mosquitoes among others - in which I have been

developing and improving, in the perspective of developing a prototype; the project: "Sustainable Kit of ATHIS" - in order to combat the pathologies of sick houses. A remedy to mitigate these dwellings built without the help of architects or engineers. Families who always use the resources of the SUS or the Public Defender's Office again, with solutions that we must take the lead. In addition to the KIT proposal, sanitary actions are addressed and carried out (such as the "No house without a bathroom" program, CAU/RS) and the inclusion of the energy transition (with the introduction of photovoltaic panels on the roofs of homes).

Figure 07: Pits for passive energy efficiency. 2024.



Source: ARCHDAILY, November 2024.





## **CONTRIBUTION AND PRELIMINARY RESULTS: CATALOGUE AVAILABLE FOR SELF-MANAGEMENT**

- 01 – NEW LIGHT PANEL + ELECTRICAL ADJUSTMENTS: For the house that has its (1) precarious electrical installations, exposed or showing signs of risk to fire or shocks.
- 02 – ATRIUM, VERTICAL OPENING/PIT - (I) SHED SYSTEM, (II) STRUCTURE (Wood or steel), (III) SLAB HOLE (+ Slab Waterproofing): (3) Humidity and mold, (5) Infiltration, precariousness regarding (6) Ventilation and (7) Lighting.
- 03 – ADEQUACY OF VERTICAL CIRCULATION: (9) vertical circulation with risk. This item also considers the Slab Right. 10
- 04 – FLEXIBLE ALUMINUM EXHAUST DUCTS AND MERV11 FILTER: (3) humidity/mold and (6) poor ventilation.
- 05 – TRANSLUCENT WIND EXHAUST FANS, COBOGÓ AND SHUTTERS: (6) ventilation, (7) precarious lighting.
- 06 – HEALTHY TECHNIQUES WITH SOIL; COATING AND FINISHING: (3) moisture/mildew, (4) cracks and cracks, and (10) poor finishes. Balance humidity within health standards (MINKE, 2022).
- 07 – BATHROOM: (2) precarious hydraulic installations.
- 08 – APPLIED ENERGY EFFICIENCY: Each house as a mini solar power plant. Considering LAW NO. 14,300, OF JANUARY 6, 2022.
- 9 – LAYOUT READJUSTMENT: Adequacy, efficiency in living by the ATHS professional: Breaking of any eventual wall/slab - same labor as the pit; repositioning of the Layout (readjusted house furniture in the appropriate rooms);

Figure 09: Sustainable ATHIS KIT: Combating the Symptoms of Housing Unhealthiness

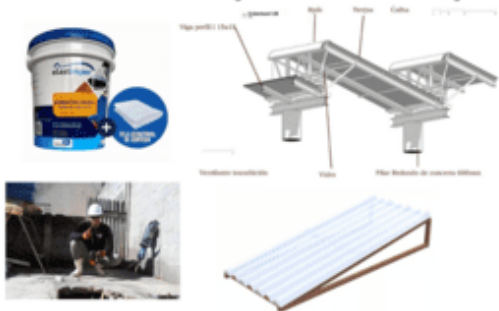
## NOVO QUADRO DE LUZ:

(1) INSTALAÇÕES ELÉTRICAS



**ÁTRIO, ABERTURA/FOSSO VERTICAL + SHED:**

(3) UMIDADE E MOFO, (5) INFILTRAÇÃO, PRECARIEDADE QUANTO A (6) VENTILAÇÃO E (7) ILUMINAÇÃO.



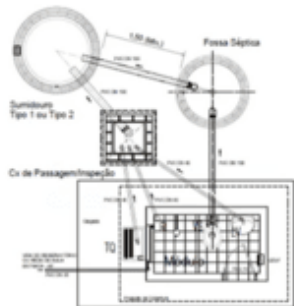
### TÉCNICAS SAUDÁVEIS COM TERRA-REVESTIMENTO E ACABAMENTO:

(3) UMIDADE/MOFO, (4) TRINCAS E RACHADURAS E (10) ACABAMENTOS PRECÁRIOS.



**BANHEIRO DE QUALIDADE:**

## (2) INSTALAÇÕES HIDRÁULICAS



### ADEQUAÇÃO DE CIRCULAÇÃO VERTICAL:

(9) CIRCULAÇÃO VERTICAL



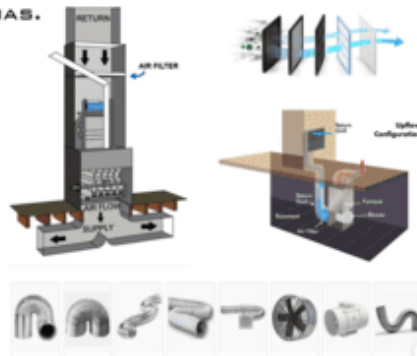
**EXAUSTORES EÓLICOS TRANSLÚCIDOS**  
**PERSIANA VERTICAL (ABERTURA TOTAL):**

(6) VENTILAÇÃO, (7) ILUMINAÇÃO



### DUTOS EXAUSTORES FLEXÍVEIS DE ALUMÍNIO:

(3) UMIDADE/MOFO E (6) VENTILAÇÃO PRECÁRIAS.  111



## EFICIÊNCIA ENERGÉTICA APLICADA

### PLACAS FOTOVOLTAICAS:

## JUSTIÇA ENERGÉTICA E TRANSIÇÃO JUSTA



Source: Authorial Production, 2023.

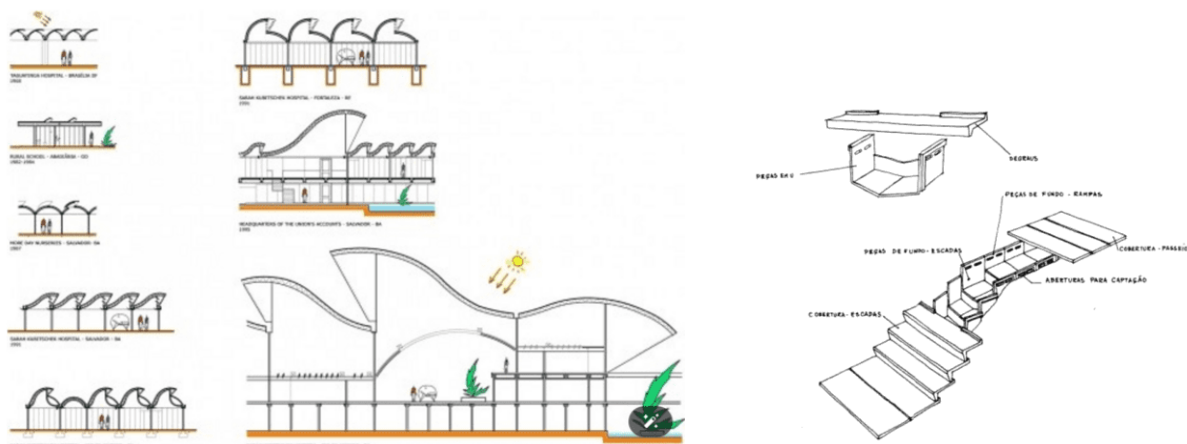


## INDUSTRIALIZATION AND SYSTEMATIZATION IN THE TREATMENT OF SICK HOMES: A PERSPECTIVE OF ESCALATION

Therefore, with the empirical knowledge of the main pathologies of Unhealthy Housing (figure 04 – TABLE) considering the housing deficit, which is of immense proportions – making it a challenge among Architects and Urban Planners expected to take place for decades – it is desirable to think of solutions that are easy to reproduce and systematize for the gain of scale. Will it be possible to execute a KIT with the same 30 thousand reais spent on SUS?

Similar to the practices of architect João Filgueiras Lima – Lelé, and his production of industrial design: "always with the contribution of the factories that he himself assembled and managed, João Filgueiras Lima reconciled the technological possibilities of industrialization with modern aesthetic precepts" (MARQUES, 2022).

Figure 10: João Filgueiras Lima, ecology and rationalization



Source: VITRUVIUS, 2016 – Drawing by André Marques from Lelé's originals

Figure 11: This House for Sale.



Source: Authorial Photography, ATHIS Residency, 2023 – Page 85.

## HOW TO MAKE IT VIABLE?

PROPOSAL / SUGGESTION: Empirical Research bringing together the Technical Assistant Architects.

The research methodology involves three stages: (i) Immersion of Residents/Technicians of social housing, placing oneself, at first, in the field doing a research in the public health centers (UBSs, UPAs, AMAs, CAPS), (ii) after signing the ethical terms of confidentiality, we request the data – especially the zip code – of patients suffering from respiratory diseases (pneumonia, tuberculosis). (iii) Cartographic exercise and generation of materials for use in a more accurate, statistical way.

CHALLENGES: A) Data from health systems. B) Favela resident without zip code. C) Search for financing and business partnerships. D) Continuity of Public Policies and Interdisciplinary Aids; (I) ATHIS Secretariat, (ii) Social Workers Assistance, (iii) Better Living Program<sup>2</sup>, (iv) Family Doctor, (vi) Demographic Census Survey.

With the distribution of the city, and not only income (MARICATO, 2017) to peripheral subjects (D'ANDREA, 2019) paying attention to gentrification, we can mitigate vulnerabilities and negative environmental impacts, in the perspective of "postponing the end of the world" (KRENAK, 2019).

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<sup>2</sup> Better Living Program - Developed by the Department of Urban Development, Housing and Environment (SDUHMA) based on Complementary Law No. 132/2006 - Art. 148 - Decree No. 36/2022, in a settlement in the municipality. The decree in question regulates, at the municipal level, the principles of Federal Law No. 11,888/2008 (ATHIS Law)



Figure 12: Fieldwork.



Source: Authorial Photography, ATHIS Residency, 2023 - page 23.

## DISCUSSION OF THE RESULTS

The harmony between the three main agents involved such as; the technicians (Urban Architects, HEIs, NGOs, etc.), the beneficiaries (low-income families, social movements, cooperatives, etc.) and the government agencies (Union, State, Municipality, Sub-prefecture) are fundamental to maintain a coordinated and systematized logic of work – between the project, material and labor – and in the distribution of subsidies for ATHIS actions.

A solution concerned with including and propagating – Public Health, Socioeconomic and Environmental Justice – the favelas throughout the national territory – dialoguing with 11 of the 17 Sustainable Development Goals (SDGs) in addition to meeting the ESG (Environmental, Social and Governance) agenda, – therefore, colluding with the interest of companies, cooperatives, municipalities and other agents, possible financiers who seek results and efficiency.

The requalification of a pre-existence, with the practices of land or building regulation in slums, which do not present geological risk, are much more economically viable and ecologically correct actions than the construction of new HIS units, in even more isolated areas of the city. Following this reasoning, it is possible to draw the parallel – ATHIS is Favela Retrofit.

Figure 13: Agenda for 2030 - SDGs.



Source: United Nations.

Save on the resources of the SUS and the Public Defender's Office, with solutions that we must take the lead."Those who have medicine for sick houses are the Architects, so we are health professionals!" (HOLZMAN, 2023).

Figure 14: Staircase and Territory.



Source: Authorial Photography, ATHIS Residency, 2023 – Page 117.

"Moderation dispenses with doctors. Justice dispenses with judges" (Plato, The Republic – Book IV).



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