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Problemas vistos por dentro: precariedade habitacional intradomiciliar e os limites das tradições de política habitacional em favelas

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Problems Seen from Within: Intra-Dwelling Housing Precarity and the Limits of Housing Policy Traditions in Favelas

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Abstract

In Brazil, favelas have consolidated as one of the main forms of settlement for the poor population, with the most recent national census identifying more than 12,000 territories. The formation of and public intervention in these settlements is shaped by two established traditions in housing theory and planning: self-construction, through which residents build their homes incrementally and autonomously, and favela upgrading, through which the state intervenes to improve housing conditions. Yet despite decades of investment by residents and public authorities, high levels of housing precarity persist, particularly inside dwellings. Available institutional indicators capture only general dimensions of this precarity, failing to reach the internal physical conditions of self-built homes, including construction deficiencies, building pathologies, and habitability deficits, constraining academic reflection and policy formulation. In this context, this article draws on a 2025 research project combining CAPI (*computer-assisted personal interviewing*) household surveys and architectural surveys in Heliópolis, São Paulo's largest favela, to illuminate the problems of persistent precarity and assess the limits of these traditions as responses to adequate housing. The findings contribute to debates on habitability and housing precarity in the Global South, where these traditions are widely adopted and shape the circulation of ideas in similar contexts.

Keywords: Brazil, Favelas, Self-help housing, Housing inadequacy, Precarity, Slum upgrading

1. Introduction

In the field of housing studies, the physical and habitability conditions of dwellings and their impacts on residents' lives are a recurring concern, particularly in informal urban settlements. Habitability, as established by the UN Committee on Economic, Social and Cultural Rights and systematised by the OHCHR (CESCR, 1991; OHCHR, 2021) and the World Health Organization's housing and health guidelines (WHO, 2018), encompasses a broad set of attributes ranging from urban infrastructure and access to public services to the more immediate conditions of the built environment within housing units. While the first dimension has been widely documented and debated, the interior of the dwelling, the space of the most immediate experience of inhabiting, remains under-represented in both applied research and theoretical reflection (Reyes; Sletto; Cos, 2024).

This gap is particularly relevant in informal settlements, where intra-dwelling conditions take on especial complexity. An emerging research agenda has been documenting the impacts of physical housing conditions on residents' health, linking overcrowding and constructive inadequacy to higher incidence of respiratory, allergic and chronic diseases, as well as to increased stress and other mental health burdens (Anwar et al., 2021; Campagna, 2016; Ogbonna; Ochie; Aniwada, 2024; Vaid, 2023; Park, 2026). Few of these studies, however, address habitability in a territorialised manner, that is, by relating internal dwelling conditions to the logics of settlement production as a whole, and fewer still articulate them with the housing planning traditions that shape interventions in these territories.

In Brazil, this discussion is especially relevant in relation to favelas, which formed and consolidated around two traditions of housing theory and planning practice oriented towards access to and improvement of housing conditions: incremental self-construction and the upgrading of informal settlements. Set within a historical context of urbanisation marked by

the structural exclusion of the poor from the formal housing market, favelas became the main form of settlement for large segments of the urban population (Fix; Arantes, 2022; Caldeira, 2017), an expression of a pattern widely present in cities across Africa, Asia and Latin America, where resident-led urbanisation remains the predominant form of housing for the poorest (Van Noorloos et al., 2020).

The first of these traditions, that of self-construction as a positive and autonomous process, has its roots in experiences with informal settlements in Latin America during the 1950s and 1960s, particularly in Peru, and was influentially systematised by John Turner (1972; 1976). For Turner, popular housing built incrementally by residents themselves would be capable of generating dignified living conditions, provided it was supported by security of tenure and access to basic infrastructure. This argument shaped World Bank housing policies from the 1970s onwards, inspiring sites-and-services programmes and support for self-construction across Africa, Asia and Latin America (Harris, 2003; Mukhija, 2001). A later variant of this tradition, associated with Wakely and Riley (2011) and Wakely (2018), partially shifts the emphasis from individual autonomy towards a more active partnership with the state, proposing that governments combine security of tenure, infrastructure provision and technical assistance in support of the incremental self-construction process, an approach known as aided self-help building. In both versions, the fundamental premise remains the same: the combination of residents' action and some form of state support would be sufficient to guarantee adequate housing conditions over time.

The second of these traditions, that of informal settlement upgrading as state-led physical intervention, consolidated as the predominant policy response to precarious conditions in these territories. With roots in neighbourhood improvement programmes that multiplied across Latin America from the 1960s and 1970s onwards, shaped both by Turner's thinking

and by World Bank directives, upgrading progressively became the hegemonic approach in housing policies for the urban poor across different regions of the world (Harris, 2003; Mukhija, 2001; Mukhija, 2006; Werlin, 1999). In Brazil, this process deepened particularly from the 1980s onwards and culminated in federal favela upgrading programmes with relative reach across the national territory, such as the Growth Acceleration Programme (PAC) (Denaldi; Cardoso, 2021; Pasternak; D'Ottaviano, 2018).

Although distinct in their scale of operation, both traditions share a fundamental gap: neither addresses the internal physical conditions of housing units in a systematic manner. The first operates predominantly at the dwelling scale, but relies on time and residents' autonomy to guarantee constructive quality. The second acts predominantly at the macro scale of the settlement, providing surrounding infrastructure and community facilities without necessarily reaching the interior of dwellings. This limitation is the subject of a critical debate that goes back to the very origins of these traditions, with authors such as Burgess (1982) and Ward (1982) arguing that the valorisation of self-construction, in any of its versions, relieved the state of responsibility and romanticised poverty, and Mukhija (2001; 2002) demonstrating that the pre-existing physical conditions of settlements are determining variables that policies built on these premises tend to underestimate. Recent studies confirm the persistence and, in many cases, the deepening of housing precarity even in extensively upgraded settlements, a phenomenon that some authors characterise as “re-precarisation” (Klink, 2025) or, in the international debate, as the “slumification” of consolidated informal settlements (Azhar; Buttrey; Ward, 2021), documented across different urban contexts (Marques; Saraiva, 2017; De Santana Souza; Samora, 2022; Reyes; Sletto; Cos, 2024).

This twofold insufficiency of theoretical traditions and intervention practices finds correspondence in an equally significant gap in the domain of data. The main sources of

housing information in Brazil, the Demographic Census and the Continuous National Household Sample Survey (PnadC), both produced by the Brazilian Institute of Geography and Statistics (IBGE), alongside the housing inadequacy indicators elaborated by the João Pinheiro Foundation (FJP), offer broad territorial coverage but limited depth regarding the internal conditions of dwelling units. The FJP captures aspects such as inadequate floor, wall and roof materials and the absence of an exclusive bathroom, but does not disaggregate these data for informal settlements, particularly favelas, nor does it reach other central attributes of intra-dwelling habitability. Their data collection instruments reach, so to speak, the threshold of the front door, but do not cross it. This limitation directly constrains both the production of knowledge about real housing conditions in favelas and the formulation of evidence-based public policies (UN-Habitat, 2024). The international academic literature presents similar limits: although the housing and health agenda has been advancing, studies that simultaneously articulate intra-dwelling housing quality, informal housing production and upgrading policies have low intersection, suggesting a structural fragmentation between disciplinary fields that rarely engage with one another.³

It is against this backdrop that the critical tradition of Brazilian urban and housing studies carries particular weight, embodied above all in Gabriel Bolaffi's landmark text (1979), for whom housing problems in Brazil were systematically framed not from their intrinsic characteristics, but from the needs of power strategies and dominant ideologies. Bolaffi identified in the "physical deterioration of urban dwelling" a real problem that remained systematically rendered invisible by the official formulation of the housing question. Inspired

³ The scarcity of studies simultaneously articulating intra-dwelling housing quality, incremental housing, and upgrading policies was verified through a systematic search in the Scopus and Web of Science databases (TITLE-ABS-KEY fields), testing five progressive search compositions. Combining terms related to housing precarity and quality with terms referring to informal settlements returned 198 results. Adding a self-construction facet reduced the corpus to 2 results, stable even with lexical expansion. Incorporating an upgrading facet returned 12 records. The simultaneous combination of all four facets returned only 1 result. The stability of results across different configurations suggests a structural fragmentation between disciplinary fields that rarely engage with one another.

by this critical tradition, this article proposes that the internal physical conditions of self-built dwellings in favelas that have undergone upgrading processes constitute the problem that data cannot reach, that policies rarely address and that theoretical debates have not yet consistently incorporated.

The empirical basis for this reflection is the research project "Upgraded favelas in São Paulo: built environment and appropriation after construction works", funded by the São Paulo Research Foundation (FAPESP). Organised around three thematic axes, the project devotes one of them specifically to the internal physical characteristics of favela dwellings. The territorial focus is São Paulo, the largest and most populous city in the country and an emblematic case of the paradoxes of favela upgrading policy in Brazil (Pasternak; D'Ottaviano, 2018). Within this universe, Heliópolis was selected as the research area as it is considered the city's largest favela, for its qualitative representativeness in terms of urban fabric and patterns of settlement production, and for its long history of public interventions, which makes it a paradigmatic case for examining the effects and limits of favela upgrading (Sampaio, 1991; Moreira, 2017). The research adopted an intra-dwelling approach, combining two complementary instruments: a household survey conducted using the CAPI method (computer-assisted personal interviewing), stratified according to the type of street on which each dwelling is located, and a metric-architectural survey of housing units focused on material and constructive characteristics, with particular attention to inadequacies and pathological manifestations.

What this article sets out to do, therefore, is name what available data and theoretical debates have not yet clearly seen: the precarity that persists within favela dwellings even after decades of public intervention and residents' own investment, and that resists both the premises of autonomous or aided self-construction and those of upgrading policies. To do so,

it organises the research findings into ten statements of "real problems", inspired by Bolaffi's critical tradition (1979). To advance this agenda, it is necessary to see the problems from within.

2. Brazilian favelas: scale and general characteristics

Favelas have been part of the production of urban space and the landscape of Brazilian cities since the late nineteenth century, predating their formal conceptualisation (Valladares; Anderson, 2019). Today, they are understood as "popular territories originating from the diverse strategies used by the population to meet, generally in an autonomous and collective manner, their housing needs and associated uses, given the insufficiency and inadequacy of public policies and private investments directed at guaranteeing the right to the city" (IBGE, 2025). This definition, encompassed under the denomination "favelas and urban communities", was widely contested over time, and its institutional consolidation drew significantly on theoretical reflection and academic research in the field.

Distributed across the entire national territory, with greater concentration in metropolitan regions, favelas are also profoundly diverse and heterogeneous, with substantial differences within a single city and even more pronounced variations across states and regions (Denaldi, 2026). For their identification, IBGE establishes a combination of criteria that, when present together in a single settlement, allow for its recognition. In addition to the predominance of dwellings with varying degrees of legal insecurity of tenure, at least one of the following must be present: the absence or incomplete and precarious provision of public services such as water supply, sanitation and waste collection; the predominance of buildings, road layouts and infrastructure that are self-produced or guided by urban and constructive parameters different from those set by public authorities; or location in areas where occupation is restricted by environmental or urban legislation, or in urban sites characterised as areas of

environmental risk (IBGE, 2025). This set of criteria acknowledges the internal heterogeneity of these territories and avoids reducing them to a single condition of precarity, while precisely delimiting what distinguishes them from other forms of urban settlement.

The 2022 Demographic Census identified 12,348 favelas and urban communities in Brazil, housing 16,390,970 people, approximately 8.07% of the Brazilian population. These territories cover an area of 2,041.46 km² and house approximately 6.6 million dwellings, representing 7.23% of all dwellings in the country, meaning 1 in every 14 Brazilian dwellings is located in a favela (IBGE, 2025). These figures reveal not only the magnitude of the phenomenon, but its centrality in the country's urban housing structure.

The sociodemographic profile of favela residents reflects structural dimensions of Brazilian sociospatial exclusion, particularly its racial configuration. The Black population, composed of people of Black and mixed-race colour, accounts for 72.94% of favela residents, a proportion significantly higher than outside these territories, where the figure stands at 55.5%. The white population, by contrast, represents 26.6% of favela residents compared to 43.5% in other settlement types, a distribution rooted in the historical inequalities of Brazilian society and the way they are inscribed in urban space. Women predominate, at a ratio of 93 men per 100 women, with a median age of 30 and approximately 45 elderly residents for every 100 aged 14 or under, pointing to a young but ageing population.

On basic infrastructure, the 2022 Census data show meaningful progress in certain areas: 96.73% of favela dwellings are served by waste collection, 99% have an exclusive-use bathroom, 86.38% are connected to the public water network, and 78.52% are on paved streets. Sewage network connection, however, reaches only 61.39% of dwellings, revealing a persistent gap in sanitation (IBGE, 2025). These figures suggest that favela upgrading policies have made real advances in urban infrastructure provision, even if with considerable

variation in service quality and continuity across settlements and regions. At the same time, they point to a displacement of the problem: as the surrounding urban environment has improved, persistent precarity in these territories is increasingly concentrated within dwellings themselves, a dimension for which little data exists and to which both academic reflection and public policy have given insufficient attention.

3. The limits of national data: the interior of dwellings as a poorly known dimension

Among the criteria that internationally define adequate housing, habitability holds a central place. Housing is not adequate if it fails to guarantee physical safety, sufficient space and protection against cold, damp, heat, rain, wind, structural hazards and disease vectors, conditions that materialise, fundamentally, within the interior of housing units (CESCR, 1991; OHCHR, 2021; WHO, 2018). Despite this normative recognition, a recent UN-Habitat report (2024) notes that available data on housing adequacy are frequently insufficient and that existing information tends to be analysed in isolation, focusing on one variable at a time, which prevents an understanding of the interdependencies and complexities that characterise real housing conditions. Knowing the habitability conditions of a dwelling therefore requires, necessarily, entering it, generating empirically grounded data through instruments capable of capturing what aggregated indicators cannot reach.

In Brazil, the Demographic Census, already referred to above, conducted every ten years, and the Continuous National Household Sample Survey (PnadC), carried out annually, are the country's main housing data collection instruments. Both are essential to understanding Brazilian housing characteristics, but their questionnaires have significant limitations regarding the internal physical conditions of dwellings. The basic Census questionnaire, applied to all dwellings in the country, addresses no internal aspect of the dwelling beyond

the number of exclusive-use bathrooms. The sample questionnaire, applied to a stratified proportion of dwellings, goes somewhat further, covering questions on external wall materials, total number of rooms, number of bedrooms and the presence of domestic appliances, but remains far from capturing the habitability conditions that the literature identifies as determinant for adequate housing.

The PnadC underpins the national housing deficit and inadequacy indicators produced by the João Pinheiro Foundation (FJP). For inadequacy, the FJP organises its components into three broad dimensions: urban infrastructure inadequacy, building inadequacy and land tenure inadequacy. The building component, most directly related to the internal physical conditions of the dwelling, is defined by five subcomponents collected through the PnadC: absence of an exclusive bathroom, absence of a water reservoir, inadequate roofing material, inadequate floor material, and a number of rooms equal to the number of bedrooms, indicating the absence of minimum functional separation of domestic spaces (FJP, 2025). Beyond the limitations already noted, these indicators do not allow disaggregation by settlement type, making it impossible to identify conditions specific to favela dwellings separately from other forms of settlement. The most recent data, released in 2025, show that 27,661,405 dwellings, equivalent to 40.8% of all Brazilian dwellings, present some level of inadequacy, of which 12,593,606 show building inadequacy. These figures reveal the magnitude of the housing problem in the country and represent a relevant institutional monitoring effort; the building component's subcomponents, however, are insufficient to characterise the complexity of constructive conditions in self-built dwellings, particularly in favelas, where inadequacy manifests in more diverse, combined and hard-to-capture ways.

The few academic studies that have taken favela dwellings as a direct object of investigation confirm this insufficiency and help reveal what national data cannot reach. Studies by

Carvalho (2008), Coelho (2017) and Piqui (2023) find that dwellings in these territories are marked by conditions that undermine the salubrity and physical safety of residents. Piqui (2023), investigating an upgraded favela in the São Paulo Metropolitan Region, found that 46% of dwellings in the sample had at least two rooms without windows, with particularly high incidence in kitchens, bathrooms and bedrooms, and that there was a high prevalence of staircases and roof slabs without guardrail protection, exposing residents to concrete risks of falling. In the international context, Reyes, Sletto and Cos (2024), investigating a consolidated informal settlement in Mexico City, demonstrated that even after decades of consolidation, heterogeneity in internal constructive conditions persists significantly, confirming that the insufficiency of intra-dwelling data is not an exclusively Brazilian limitation, but a structural gap in housing studies on informal settlements.

There is, therefore, a twofold insufficiency. Available data not only present quantitative limitations, but lack the qualitative depth needed to characterise housing conditions across the country, a limitation that deepens considerably when the focus turns to favelas. Housing inadequacy, as the FJP figures make clear, is not confined to these territories, which resists any simplifying argument; yet the building component's subcomponents are insufficient to capture the specific constructive problems of self-built dwellings, making the data even less useful for this particular universe. The institutional monitoring effort is both relevant and irreplaceable, but the available instruments produce a partial body of knowledge that feeds debates on the basis of incomplete evidence.

4. The research design: territory, methodology and bases for confronting housing planning traditions in favelas

The context presented in the previous sections guided fundamental decisions in the conception of the research. Given the heterogeneity and quantity of favelas in Brazil,

standardised parameters at national level prove insufficient to capture the specificities of each territory, making it methodologically more consistent to focus the research on a specific city. São Paulo, the largest city in the country and the one with the greatest number of favelas, was the chosen focus. Within it, Heliópolis, the largest favela in the city, was selected as the research territory.

Heliópolis has its formation directly linked to the favela intervention policies adopted in São Paulo from the 1970s onwards, a period marked by practices of eradication and removal of precarious settlements. The area began receiving families relocated from other favelas in the city, consolidating itself through intense land conflicts and demands for the right to housing (Sampaio, 1991; Moreira, 2017). With approximately one million square metres and more than 200,000 inhabitants, it is one of the settlements of greatest territorial and population expression in the São Paulo metropolis. Upgrading interventions occurred in a continuous and discontinuous manner across different public administrations, in a process characterised by the overlapping of "layers" of state intervention (Cardoso; Denaldi, 2018), intensified after the federal investments linked to the PAC from 2008 onwards (Moreira, 2017). Now well integrated into the São Paulo urban fabric, Heliópolis combines a long history of public interventions with growing dynamics of housing commodification, making it a paradigmatic case for examining the limits of favela upgrading.

Within Heliópolis, Núcleo Mina was selected as the territorial unit for the research, as it presents characteristics representative of the settlement as a whole, chosen in dialogue with the União de Núcleos, Associações dos Moradores de Heliópolis e Região (UNAS). Núcleo Mina is characterised by high vertical and constructive density, large blocks with streets of reduced dimensions and numerous internal pathways forming block interiors. The sample was set at 124 dwelling units, representing a confidence level of 90% with a margin of error

of 7.27% over a universe of approximately 4,700 units. To preserve spatial cohesion, the survey was concentrated in three contiguous blocks, with stratification according to two street types: block-structuring streets and internal block pathways. This distinction is methodologically relevant because a dwelling's position within the settlement's urban fabric tends to condition its physical characteristics: dwellings on block-structuring streets generally present different conditions from those located on internal alleyways, where constructive density and precarious infrastructure access are more pronounced. These two classifications became the main variables for ensuring sample diversity.

The research combined two complementary instruments. The first is the household survey conducted using the CAPI method (computer-assisted personal interviewing), organised around four groups of questions covering the production and tenure of the dwelling, the socioeconomic characteristics of residents, public and domestic infrastructure, and residents' perception of problems and improvement needs. The second is the metric-architectural survey of housing units, focused on the material and constructive characteristics of the dwellings, with particular attention to constructive inadequacies and pathological manifestations such as the absence of windows in rooms, damp and water infiltration, cracks, precarious electrical installations, exposed hydrosanitary installations and the absence of handrails and guardrails. The findings were processed by cross-referencing socioeconomic information from the survey with physical characteristics from the architectural survey, analysed according to the primary variables of street type and tenure type.

Table 1 systematises the conceptual basis for characterising the conditions found in the surveyed dwellings as "real problems", across four complementary perspectives: the central habitability theme; the international adequate housing criteria established by the CESC (1991), OHCHR (2021) and WHO (2018); the premises of the two traditions of housing

theory and planning practice discussed in this article; and the variables actually measured by the research. The themes are presented in a scalar and relational order: from tenure as the foundational condition for any dwelling investment, through surrounding infrastructure, into the interior with ventilation, damp, space and structural safety, closing with the temporal and combinatory dimension that connects all the preceding ones.

Table 1. Habitability conditions: criteria, tradition premises and evidence needed to confront them

Theme	International adequate housing criteria	Premise of incremental housing	Premise of upgrading policies	Variables measured by the research
Tenure and housing access	Legal security of tenure as a condition for the exercise of the right to housing, regardless of type of occupation	Security of tenure is a condition for residents to progressively invest in dwelling improvement	Land tenure regularisation is a structural component of upgrading policies	Tenure type (owner-occupied, rented, granted); landlord profile; rental value and income burden
Infrastructure and services	Access to safe water, sanitation, energy, waste collection and essential services as habitability conditions	Access to basic infrastructure is a condition for incremental housing to produce dignified housing over time	Provision of water, sewage, energy networks and paved streets is the central objective of upgrading policies	Quality and regularity of internal hydrosanitary installations; presence and type of water reservoir; type and regularity of electrical connections; street accessibility of the dwelling
Natural ventilation and lighting	Access to natural light and ventilation as conditions of salubrity, respiratory health and residents' well-being	Residents, given time and autonomy, adapt the dwelling to their needs, including openings and ventilation	Improvement of surrounding infrastructure creates indirect conditions for internal dwelling improvements	Presence/absence of windows per room; windows facing covered environments; windows obstructed by neighbouring buildings

Protection against damp and pathogenic agents	Protection against damp, cold, heat and disease vectors as essential conditions of habitability and health	The incremental process progressively improves constructive materials and surface finishes	Installation of sanitation networks reduces rising damp and sanitary risks in the surrounding settlement	Incidence of damp and water infiltration per room; absence of external rendering; origin and type of pathological manifestation
Sufficient space and functionality	Sufficient space for residents and minimum functional separation of domestic spaces as conditions of housing dignity	Progressive expansion of the dwelling over time guarantees adequate space for the family	The intervention presupposes a minimum land area per family, sufficient for the construction and incremental expansion of a housing unit	Total floor area and area per resident; number of dwellings per building; number of storeys; excessive overcrowding; functional separation of rooms
Structural safety and protection against accidents	Protection against structural hazards and domestic accidents as conditions of residents' physical safety	Given time and resources, residents progressively complete and consolidate the dwelling's structure	Targeted technical assistance in some upgrading programmes supports building improvement	Precarious electrical installations; absence of distribution boards; absence of handrails and guardrails on staircases and roof slabs; staircase dimensions
Persistence and combination of problems over time	Adequate housing must be guaranteed and maintained over time, considering the combination and interdependence of habitability conditions	Given sufficient autonomy and time, the incremental process tends to produce progressively better housing conditions	Upgrading policies aim to produce lasting improvements that consolidate and complement each other over time	Length of residence; household income; total number and diversity of inadequacies and pathological manifestations per dwelling; correlation between length of residence and constructive conditions

Source: Own elaboration based on CESC (1991), OHCHR (2021), WHO (2018), UN-Habitat (2024), World Bank (1993), Cities Alliance (1999), Turner (1972; 1976), Wakely and Riley (2011), Wakely (2018), Mukhija (2001; 2002), Denaldi and Cardoso (2021) and the primary research data (2026).

The logic of the table operates in two articulated movements. The first maps, for each habitability dimension, what each tradition proposes within its own scale of operation: what incremental housing presupposes the resident will achieve at the dwelling scale, and what upgrading policies envisage achieving at the settlement scale. The second movement establishes that these are precisely the dimensions measured empirically by the research, producing evidence on how far the conditions found in the surveyed dwellings approximate or diverge from what the traditions propose and what international criteria establish as necessary.

Three aspects of the table deserve particular attention. The row on persistence, combination and time is relevant because both traditions presuppose that time works in favour of housing improvement; data on length of residence and income allow this premise to be directly examined. The row on tenure and housing access introduces the rental dimension as a variable that calls into question a premise common to both traditions: that the resident is an owner and investor in the dwelling.

This set of dimensions constitutes the conceptual framework from which the statements in the following section are organised and interpreted. Each statement names based on evidence the conditions that persist in the surveyed dwellings, making visible a reality that available indicators cannot portray and that housing planning traditions have yet to address consistently.

5. The Real Problems: Persistent Precarity within Favela Dwellings

Bolaffi's (1979) argument about the physical deterioration of urban dwelling as the "real problem" of popular housing in Brazil, systematically rendered invisible by the "false problem" constructed by policies and available indicators, gains new empirical dimension in

light of the findings of this research. As demonstrated in the previous sections, the two traditions of housing theory and planning practice that shaped the production of dwelling space in favelas, incremental housing and upgrading policies, operate at distinct scales and depart from their own premises, but are mutually related and share a common gap: neither addresses the internal physical conditions of housing units in a systematic manner. Available indicators reinforce this gap by failing to reach the intra-dwelling dimension, and the data produced⁴ by this research reveal what both traditions and available monitoring instruments do not illuminate.

It is precisely this interior — self-built favela dwellings seen from within, on the basis of data collected directly in the homes — that the ten statements below take as their object. Each names a set of physical and social conditions that persists even after decades of incremental housing and upgrading intervention, challenging the premises systematised in Table 1.

5.1. It Is Everyone's Problem

A first understanding that the data reveal is that, although dwellings are treated as independent units for each family, the problems identified in the research have, in reality, a collective dimension. This collectivity manifests in three planes. The first concerns the generalisation of problems: in the sample, only 0.8% of dwellings, corresponding to a single case, presented no pathological manifestation or constructive inadequacy, indicating that precarity is not the exception, but the rule. The second concerns the origin of the manifestations: many of them stem not from isolated building characteristics of each dwelling, but from the morphological conditions of the settlement as a whole, since damp,

⁴ The full research findings are available in: Denaldi, R.; Piqui, L. R. P. *Favelas urbanizadas em São Paulo: ambiente construído e apropriação no pós-obra* [Upgraded favelas in São Paulo: built environment and appropriation after construction works]. Research report. Thematic Axis 2. São Bernardo do Campo: Federal University of ABC; Centre for Favela Studies; Laboratory for Urban and Regional Studies and Projects, 2025. Available at: <https://cefavela.ufabc.edu.br/relatorios/>. The primary research data are available at: <https://zenodo.org/records/19920069>. <https://doi.org/10.5281/zenodo.19920069>

water infiltration and lack of ventilation result from the collective configuration of the habitat, from constructive density and from the overlapping of buildings. The third concerns the relationship between neighbouring dwellings: in several cases, the neighbouring unit is itself the cause of the problem identified in the surveyed dwelling, making the condition of one dwelling inseparable from that of those surrounding it.

This threefold collective dimension points to a paradox: upgrading policy, which in principle thinks of the settlement as a whole, does not identify intra-dwelling conditions as a collective problem to be addressed, but as a matter particular to each family. At the same time, incremental housing, which operates at the scale of the individual dwelling, lacks the instruments to respond to problems whose origins are structural and shared. The result is that a near-universal precarity remains without adequate response in either tradition.

5.2. Problems Vary According to the Location of the Dwelling within the Settlement

Although generalised, problems are not distributed homogeneously across the settlement: their intensity and nature vary according to the location of the dwelling within the urban fabric. In the sample, units situated on internal block pathways consistently presented more unfavourable conditions than those located on block-structuring streets.

The impacts are visible across multiple dimensions. In terms of accessibility, 58.6% of dwellings on internal pathways presented some difficulty of access for people, furniture and domestic appliances, compared to 34% on block-structuring streets. Regarding deliveries and correspondence, 40.2% of residents on internal pathways reported frequently using an alternative address to receive parcels and post, a figure that did not reach 5% on block-structuring streets. The most significant difference concerns precarious electrical installations, present in 76% of dwellings on internal pathways, compared to 45% on block-structuring streets. This reflects a structural condition of the settlement: electrical

connections, generally irregular, originate on block-structuring streets and branch out precariously into block interiors, deepening the disadvantages of the most internalised dwellings.

These findings confirm Mukhija's argument (2001; 2002) that the pre-existing physical conditions of settlements decisively shape dwelling conditions. They also indicate that upgrading policies, by prioritising main streets and the surrounding settlement environment, tend to reproduce and deepen internal inequalities between better and worse located dwellings. Incremental self-construction, in turn, by progressively occupying block interiors and opening new precarious access pathways towards the back of plots, deepens this process: as new dwellings are built in the interstices of the urban fabric, more units come to depend on derived connections increasingly distant from the main networks, accumulating constructive and infrastructure disadvantages that upgrading interventions rarely reach.

5.3. Time Does Not Resolve the Problems

One of the most recurrent arguments in the literature on incremental housing is that time, combined with residents' autonomy, would be sufficient for the gradual improvement and completion of dwellings (Turner, 1972; 1976). The research data directly challenge this premise.

The average length of residence in the surveyed units is 17.4 years, with a significant proportion of families having lived there for more than three decades: 56.5% of dwellings have residents with more than 10 years of residence, and in 32.3% of cases this period exceeds 30 years, with records of families inhabiting the same unit for 42 years. Even so, constructive problems persist and many buildings remain unfinished. The largest share of families, 36.3%, has resided in the units for between 1 and 10 years, and even within this group inadequacies and pathological manifestations are widely recurrent, indicating that

problems do not depend on time to manifest themselves. In older dwellings, however, conditions tend to worsen: prolonged exposure to damp, cracks and precarious installations, without adequate maintenance, deepens the manifestations and makes their reversal more difficult. Time, far from resolving problems, contributes to consolidating them.

This picture does not invalidate Turner's contribution to the understanding of self-construction as a social and political process, but evidences its limits when applied as a public policy premise. Wakely and Riley (2011) advanced this critique by proposing that the state must actively support incremental processes, combining infrastructure, security of tenure and technical assistance. The data show, however, that even this support, when limited to the dimension of urban infrastructure, does not reach the internal constructive conditions of dwellings. The pre-existing physical conditions of settlements, as demonstrated in the preceding statements, are determining variables that both the Turnerian perspective and upgrading policies tend to underestimate. The persistence of problems after decades of residence and public intervention reveals the need for consistent action at the intra-dwelling dimension, which remains marginal in the traditions that shaped the production of dwelling space in favelas.

5.4. Natural Ventilation and Sunlight Are Hard to Come By

Natural ventilation and lighting are basic habitability conditions, directly associated with the health and well-being of residents. In the surveyed dwellings, these conditions are widely compromised, for reasons that go beyond the simple absence of openings and that reveal the complexity of the interactions between the dwelling and the settlement's urban fabric.

In 65% of the sample, at least one room has no window opening, with predominance in bedrooms and kitchens, spaces of long permanence and greater demand for air renewal and access to natural light. In 50% of dwellings, at least one room has a window facing another

covered environment, a condition that severely limits both ventilation and lighting, functioning in practice as the absence of an effective opening. In 33% of cases, at least one window has been obstructed, generally by neighbouring buildings erected subsequently or, in some cases, by furniture inside the room. Taken together, these three situations indicate that the deprivation of natural ventilation and lighting is a structural and widespread condition in the surveyed dwellings.

To this constructive picture is added a sociocultural dimension: even when a window exists and is not obstructed, many residents choose not to open it, for reasons related to privacy and security, a recurrent condition in high-density settlements where units are in very close proximity to one another. With the growing vertical densification of the settlement, a significant share of these dwellings does not receive even a single daily period of natural light and ventilation, a condition that the literature associates with relevant risks to the respiratory health and well-being of residents, particularly children and elderly people (WHO, 2018).

5.5. Damp Is Easy to Come By

Damp and water infiltration were the most recurrent pathological manifestations, present in at least one room in 80% of the surveyed dwellings — the highest incidence among all problems coded in the architectural survey, surpassing the absence of windows and precarious electrical installations, both present in 65% of dwellings.

The predominance is concentrated in bedrooms and bathrooms, environments directly affected by the absence of ventilation openings, as demonstrated in the previous statement. The origins of damp are multiple and combined: rising damp from the ground, descending damp from roofing, transfer through external walls in direct contact with internal walls, facilitated by the near-generalised absence of external rendering, and condensation damp from vapour, particularly in bathrooms. In all cases, the result is the formation of extensive

mould patches in rooms, with situations in which damp reaches the point of running down surfaces.

The combination of high constructive density, absence of ventilation and precarious surface finishes creates structural conditions for the production and persistence of damp, regardless of residents' individual efforts to contain it, evidencing that this is a condition of the habitat itself and not an individual maintenance failure (WHO, 2018). Although upgrading policies have advanced in the installation of sanitation networks, reducing sanitary risks in the external environment of the dwelling, the damp that manifests within dwellings has predominantly constructive origins that interventions in the surrounding settlement do not reach.

5.6. There Is a Risk of Fire

Among the problems identified, those related to fire risk deserve special attention given the gravity of their potential consequences, particularly in high constructive density settlements where fire can spread rapidly between contiguous buildings. The data reveal that this risk results from the combination of two recurrent conditions: the confinement of cooking gas and the precariousness of electrical installations.

In 73.4% of the surveyed units, the gas cylinder is installed in an enclosed and covered internal environment, in the same room as the cooker, without a dedicated shelter, a condition that concentrates the risk of leakage in a closed space without adequate ventilation. Only 10.5% of units keep the cylinder in a dedicated shelter, in an external and open environment in proximity to the cooker, a more adequate situation as it ensures ventilation and eliminates the need for hose extensions and prolongations. To this risk is added the presence of precarious electrical installations in 65% of the dwellings in the sample, associated with a widespread absence of dedicated electrical distribution boards.

The combination of confined gas and irregular electrical installations configures a widely disseminated risk scenario, determined to a large extent by the absence of space and the constructive constraints of the settlement, whose potential consequences extend beyond the limits of each unit and reach the surrounding buildings.

5.7. Residents Are at Risk of Falling

The vertical growth of self-built dwellings in favelas is a response to densification and the limitation of available land, but brings with it concrete risks of domestic accidents, particularly from falling. The data reveal that these risks are widely present in the surveyed units, both on internal staircases and on rooftop slabs.

Staircases are present in 67% of the surveyed units: in 35% there is one staircase, in 27% two, and in 4% three or more. In addition to the recurrent absence of handrails and guardrails, the average dimensions of the staircase components are at odds with the parameters established by building codes: average tread of 24 cm, average riser of 23 cm, average width of 75 cm, minimum headroom of 188 cm and an average of 12 steps. In the most critical cases, dimensions reach situations of extreme risk, with a tread of 11 cm, a riser of 28 cm, a width of 55 cm and a minimum headroom of only 95 cm. These proportions indicate steep, narrow staircases that are difficult to use safely, built under severe space constraints, a result of incremental vertical growth without technical guidance.

To this risk are added the rooftop slabs, present in buildings with an average of three storeys, used by residents for everyday activities such as hanging laundry and recreational use, without guardrail protection. The combination of inadequate staircases and unprotected roof slabs configures a scenario of fall risk that is structurally present in the surveyed dwellings, a direct expression of the limits of incremental vertical growth without technical support. This is a problem that public technical assistance for self-construction could mitigate, but that

generally remains outside the scope of both upgrading programmes and housing policies directed at favelas.

5.8. Too Little Space for Too Many People

Favela housing rarely corresponds to the image of a single family in an isolated unit. The data reveal a reality of intense superposition: families and dwellings multiply within buildings of limited space, configuring a pattern of densification that operates simultaneously at different dimensions. The average number of residents per surveyed housing unit is 3.34 inhabitants, with buildings housing an average of three distinct dwellings, reaching extreme cases of 10, 12, 15 and even 32 units within a single building. The average number of storeys per building is three, expressing the way in which space is fractioned and occupied in a growing manner.

This process of vertical growth and multiplication of units is a manifestation of the incremental logic of self-construction in the peripheries of the Global South, which Caldeira (2017) describes as a structural response to exclusion from the formal housing market, but which, as the data show, produces physical conditions that upgrading interventions rarely manage to reverse. The average floor area of the surveyed units is 52.45 m², a value that exceeds by 12.45 m² the minimum area adopted by the Minha Casa Minha Vida programme (PMCMV), Brazil's main federal housing provision programme, set at 40 m². However, 41% of the units in the sample fall below this parameter, indicating that a significant share of self-built dwellings in favelas does not even reach the minimum floor area established by public policy.

5.9. Precarious Dwellings for Rent

The rental market is significantly present in upgraded favelas, with 33.1% of the dwellings in the sample in a rental situation, compared to 56.5% owner-occupied (nevertheless, often

self-declared informal owners) and 10.5% granted. Of these rentals, 24.4% are negotiated directly with landlords who do not reside in Heliópolis and 14.6% through local real estate agencies, indicating a tendency towards rentals mediated by landlords absent from the territory. This picture points to a growing process of commodification of favela housing and to informal real estate dynamics of broader reach, documented in both Brazilian favelas and informal settlements across the Global South (Stiphany; Ward; Perez, 2024; Klink; Denaldi, 2025; Scheba; Turok, 2020).

The rented dwellings in the sample concentrate all the precarious conditions identified in the previous statements, with an average floor area of 48.06 m², below the overall sample average. Tenants have little power to intervene in these dwellings, since they do not hold ownership and, for that very reason, are frequently not reached by public housing improvement policies, which tend to prioritise owner-occupied units. This overlapping of conditions — paying rent, living in a precarious dwelling and not being covered by policy — configures a situation of unprotection that available housing indicators cannot capture.

The significant presence of rental housing also raises a challenge little discussed in the context of upgrading and land tenure regularisation policies: when the resident is a tenant rather than an owner, the benefits of physical improvements and legal security tend to be appropriated by the landlord, who may raise rental values in response to the appreciation of the building. This effect, documented in upgrading experiences in Brazil and other contexts, indicates that interventions that do not account for the condition of tenants may deepen, in an unintended manner, their situation of housing precarity (Klink; Denaldi, 2025; Scheba; Turok, 2020). Both the thinking on incremental housing and upgrading policies presuppose the resident as owner and investor in the dwelling; for the tenant segment, which represents

one third of the sample, this premise simply does not apply. Consequently, the latter faces a twofold challenge: paying high rents for low-quality housing.

5.10. Problems Combine

The previous statements described, each in their own way, specific precarious conditions affecting self-built dwellings in favelas that have undergone upgrading processes. A reading of each problem in isolation, however, would be insufficient to portray the reality found in the surveyed dwellings: problems are not distributed in a dissociated manner, but combine, overlap and frequently explain one another. The absence of windows or their obstruction by the vertical growth of neighbouring buildings, combined with the absence of external rendering, creates the conditions for the advance of damp and mould in rooms; competition for reduced land drives the vertical growth of buildings and the multiplication of staircases that, built under severe space constraints, lack guardrails and present inadequate dimensions; the more precarious electrical installations in dwellings located on internal pathways and block interiors are conditioned by their very location within the settlement, where connections originate on block-structuring streets and branch out irregularly. Understanding this combination is as important as identifying each problem individually.

The data confirm this superposition in a compelling manner. The average number of constructive inadequacies and pathological manifestations per dwelling is 8.95, with cases reaching 31 occurrences in a single unit. Only 24.2% of dwellings present between 1 and 4 occurrences; 37.9% register between 5 and 9; 16.9% between 10 and 14; and 20.2% accumulate 15 or more occurrences in the same dwelling. In terms of diversity, the average is 4.2 different types of pathology per unit: 97.6% of dwellings present at least 2 distinct types, 79.8% at least 3, 62.1% at least 4, and 45.2% at least 5 different types combined within the same dwelling.

This combination of problems poses specific challenges for public intervention. As Mukhija (2002) argues, the physical attributes of dwellings must be treated as a central and interdependent variable, rather than items to be resolved in isolation. The combination of problems indicates that piecemeal interventions tend to be insufficient: the complexity of what is found within dwellings demands integrated approaches that consider the interdependencies between constructive conditions, settlement characteristics and the socioeconomic conditions of residents.

It is precisely this complexity that Bolaffi (1979) proposed naming with intellectual honesty, from the intrinsic characteristics of problems rather than from political conveniences. The data presented here seek to do the same, placing this knowledge as a central challenge for housing studies and evidence-based public policies — and pointing to a conclusion that the following section develops: that the traditions of housing theory and planning practice that shaped the production of dwelling space in favelas have not been sufficient to guarantee adequate habitability conditions within dwellings, even after decades of public investment and residents' own effort.

6. Conclusion

The problems presented in this article were seen from within, in both a literal and a figurative sense. In a literal sense, because the research entered the homes of Heliópolis residents, crossed the threshold of the front door and produced data on what exists inside self-built favela dwellings, a dimension that available institutional instruments cannot reach. In a figurative sense, because this entry represents an intellectual and methodological commitment to an approach that relates the internal conditions of the dwelling to the logics of settlement production as a whole and articulates them with the housing planning traditions that shape interventions in these territories.

What was found inside these homes is eloquent. In 99.2% of the surveyed dwellings, there is at least one constructive inadequacy or pathological manifestation. The average is nearly nine occurrences per dwelling, with cases reaching 31. The problems are not isolated: they combine, overlap and explain one another, in a web of physical and social conditions that fragmented readings cannot capture. And they persist, even in extensively upgraded settlements, even after decades of public intervention and residents' own investment. This persistence constitutes the central message of the article: housing precarity within favela dwellings persists despite the traditions of housing theory and planning practice, incremental housing and informal settlement upgrading, that shaped the production of dwelling space in these territories and that were, in principle, responsible for improving their conditions. It is, at the same time, under-represented in available institutional data and insufficiently addressed by the literature and by public policies.

This picture does not result from a particular failing of each tradition, but from a structural insufficiency that both share: by operating each within its own scale, incremental housing at the dwelling dimension and upgrading at the settlement dimension, they tend to leave without response the internal physical conditions of housing units. Table 1, presented in section 4, systematises this insufficiency, showing that the habitability dimensions that both traditions promise to guarantee are precisely those that the research reveals as persisting problems, and that many of their premises do not materialise in practice, some not even being pursued by interventions, even though they formed part of the foundations that justified them. Neither incremental housing, nor favela upgrading, nor both combined in their respective scales of operation, proved sufficient to guarantee adequate habitability conditions within dwellings.

The implications for housing policy are direct. The findings indicate that evidence-based policies on the internal conditions of dwellings need to incorporate data collection

instruments capable of capturing variables such as the absence of windows, damp and water infiltration, precarious electrical installations, fall risk and excessive overcrowding. The significant presence of rental housing in upgraded settlements also poses a specific challenge: the benefits of interventions tend to be appropriated by landlords, deepening the unprotection of tenants, a segment for which neither tradition offers an adequate response.

The contributions of this work are distributed across three complementary dimensions. Empirically, the research produced a body of primary data on intra-dwelling conditions in an informal settlement that finds no equivalent in available national instruments, helping to reveal a reality that institutional indicators cannot portray. Theoretically, Table 1 offers an analytical framework that articulates international adequate housing criteria, the premises of the two traditions and the variables measured by the research, allowing for a systematic assessment of the extent to which each tradition fulfilled its own objectives and foundations. Methodologically, the combination of CAPI household survey and architectural survey proved to be a robust and replicable approach for generating knowledge in a poorly explored dimension (Piqui, 2025).

These contributions extend to the international debate on housing in the Global South, particularly in Latin America, where the traditions of incremental housing and informal settlement upgrading are widely adopted and shape the circulation of ideas and public intervention practices across different urban contexts (Bertelli, 2021; Saraiva, 2022; Ortiz, 2024). These traditions not only guided policies, but contributed decisively to the formation of a large part of existing informal settlements, particularly through incremental self-construction. The gap identified in this article is not a Brazilian particularity: it is a structural insufficiency running through these traditions that, by failing to reach the

intra-dwelling dimension, remains a central challenge for studies on housing, informality and habitability.

Finally, the ten statements of real problems proposed in this article do not claim to exhaust the complexity of favela housing, nor to generalise beyond what the data allow. They aim, rather, to take up Bolaffi's call and reframe the problem in its true terms: on the basis of evidence, from the intrinsic characteristics of dwellings and the living conditions of their residents. The question that remains, as an invitation to the research agenda and to public action, is how the knowledge produced at this dimension can, in fact, guide interventions capable of addressing the persistence of precarity within the dwellings of informal settlements.

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