

Recognizing (dis)order: reading informal settlements through urban morphology

Reconocer el (des)orden: leyendo los asentamientos informales a partir de la morfología urbana

Reconhecer a (des)ordem: lendo os assentamentos informais a partir da morfologia urbana

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Abstract

Despite being widely studied, informal settlements still face the stigma of “disorder” due to their irregular urban status, a fact that makes it difficult to overcome certain vulnerabilities. New interpretations of these territories are needed to overcome this



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stigma, proposing representations capable of revealing the particular organization of their spatial configuration. This work proposes the construction of a schematic and visual panel that articulates three dimensions of analysis of the urban space of informal settlements, based on an in-depth understanding of the reality of these territories and the theoretical-methodological apparatus of urban morphology. The panel functions as a cognitive tool for investigating the urban form of the urban space of these territories. The work contributes to the development of methodologies for representing and interpreting the reality of settlements in light of the disciplinary field of urban morphology.

Keywords: Order; Informal Settlements; Urban Form.

Resumen

Aunque han sido ampliamente estudiados, los asentamientos informales aún enfrentan el estigma del “desorden”, debido a su condición de irregularidad urbanística, lo que dificulta la superación de determinadas vulnerabilidades. Se requieren nuevas lecturas de estos territorios que superen dicho estigma y propongan representaciones capaces de revelar la organización particular de su configuración espacial. El trabajo propone la construcción de un panel esquemático y visual que articula tres dimensiones de análisis del espacio urbano de los asentamientos informales, basadas en una comprensión profunda de la realidad de estos territorios y en el aparato teórico-metodológico de la morfología urbana. El panel funciona como un instrumento cognoscitivo para la investigación de la forma urbana de estos espacios. El estudio contribuye al desarrollo de metodologías de representación y lectura de la realidad de los asentamientos a la luz del campo disciplinar de la morfología urbana.

Palabras clave: Orden; Asentamientos Informales; Forma urbana.

Resumo

Apesar de amplamente estudados, os assentamentos informais ainda enfrentam o estigma da “desordem” dada a sua condição de irregularidade urbanística, fato que dificulta a superação de determinadas vulnerabilidades. São necessárias novas leituras desses territórios que superem o estigma em questão, propondo representações capazes de descobrir a organização particular da sua configuração espacial. O trabalho propõe a construção de um painel esquemático e visual que articula três dimensões de análise do espaço urbano dos assentamentos informais, baseadas no aprofundamento da realidade desses territórios e no aparato teórico-metodológico da morfologia urbana. O painel funciona como um instrumento cognoscitivo para a investigação da forma urbana do espaço urbano desses territórios. O trabalho contribui com o desenvolvimento de metodologias de representação e leitura da realidade dos assentamentos à luz do campo disciplinar da morfologia urbana.

Palavras-chave: Ordem; Assentamentos Informais; Forma Urbana.



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INTRODUCTION

Informal settlements are objectively defined as a phenomenon in which urban populations occupy parts of the city in an informal and inadequate manner from a land and urban planning perspective. Globally, these settlements have been the subject of study and concern by state agents for more than half a century. UN-Habitat (2021) expands the terms to “slums,” “informal settlements,” and “inadequate housing,” which are characterized by dwellings that lack access to water and basic infrastructure, are small and poorly built, and offer no security of tenure. The Brazilian Institute of Geography and Statistics (IBGE) has been measuring the phenomenon since 1950 and, what used to be called “aglomerados subnormais”, now defines “*favelas e comunidades urbanas*” as illegal or restricted land occupations, with urbanization outside current standards and/or with poor access to public services (IBGE, 2025).

Usually justified by the absence of the State, the existence of informal settlements is actually caused by a context of land concentration, patrimonialism, tax imbalance and a legal tradition and urban planning that are poorly adapted to the “real” city (Smolka and Mullahy, 2007). Informal settlements have historically been associated with urban poverty, while their transformations over time have resulted in heterogeneous territories that are well integrated into the economy, challenging traditional dogmas and definitions (Valladares, 2005; Leitão, 2009). Although characterized by irregularity and precariousness, these territories are responses to emergency conditions and loci of insurgent energies (Velloso, 2020).

In short, informal settlements are complex territories, susceptible to a multiplicity of representations¹. There are interpretations committed to identifying problems, as in public management diagnoses. There are also those that associate the phenomenon with the capitalist exploitation of urban land (Rolnik, 2015). There are representations that explore these settlements as experiences of struggle for the production of the city (Tanaka, 2017) and local initiatives in which the residents themselves produce perceptions about the territory, as is the case of the “*Plano Popular da Zona Especial de Interesse Social (ZEIS) Bom Jardim*” in Fortaleza.

Although there are representations that delve deeper into reality and are willing to break certain stigmas, the impression of “disorder” still remains over these territories. The condition of irregularity mediated by a specific urban pattern induces representations of informal settlements that make little use of their urban space in terms of design as a legitimate production of the city. The misunderstanding surrounding these territories is a problem that has already resulted in interventions that have perpetuated cycles of poverty (Cardoso, 2007).

In contrast to disorder, there is a form of “self-regulation” in these settlements, built on everyday practices (Nisida, 2017), which suggests the presence of a

¹ In this work, the concept of representation is presented as an exercise in interpreting reality based on specific aspects of an object of study. Constructing a representation necessarily involves choosing specific methods, techniques, and theoretical approaches, a process inherent to the production of knowledge. The representation of something is one of several ways of seeing reality.



particular organization. Identifying and understanding a differentiated spatial configuration of these territories, as opposed to the orderly space idealized by exogenous agents, is a challenge that can be addressed through the development of new representations. In this sense, urban morphology is a discipline with the potential to develop inventive readings of informal settlements (Cardoso et al 2020; Spolaor and Oliveira, 2021).

This paper argues that the theoretical and instrumental apparatus of the discipline of urban morphology is capable of developing representations of informal settlements that reveal the organization and configuration of these spaces, an exercise that contributes to the validation of a unique and spontaneous dynamic of urban production. The work proposes the construction of a schematic and visual panel that seeks to articulate the understanding of the space of informal settlements based on three dimensions: (1) The basic structure of urban form; (2) The analysis of the house as the nucleus of urban form; and (3) The study of physical form. The article first discusses the concept of order in urban space, then explores the different approaches of the discipline of urban morphology, and finally presents the construction of the panel as a cognitive tool for understanding the reality of informal settlements.

ORDER IN URBAN SPACE

The idea of order in urban space dates back to the emergence of the discipline of planning between the 18th and 19th centuries in Europe. The intense growth of urban centers caused by the industrial revolution resulted in a profusion of problems, and the city became a scientific object (Santos, 1988). Urban planning was operate as a disciplinary instrument that affirmed state control. In the 20th century, brazilian cities grew rapidly under the aegis of progress based on currents of thought imported from Europe (Santos, 1988). The positivist order was imposed on the state production of brazilian urban space, with regular forms that designed the only one desirable world.

The regulatory apparatus of 20th-century planning, marked by urban zoning, which still influences urban legislation today, contributed to the production of exclusionary legislation that condemns social groups to irregularity (Rolnik, 1997). With the prerogative of law and design, modernist urbanism froze territorial dynamics, stifled genuine urban life and had difficulty dealing with the diverse and spontaneous occupation of space (Holanda, 2013). The common idea of order in urban space is a legacy of rationalist thinking that designs a specific type of city.

Still in the 20th century, Christopher Alexander (1965) criticized the modernist perspective of the city, seeking to better recognize the dynamics of the relationships between elements that exist in urban space. François Ascher (2010) advocates for understanding the city as a living organism capable of articulating different entities and transforming itself over time. Today, there are interpretations of the



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city that seek to overcome the rationalist perspective and better understand its complexity. Under a different awareness of what the city is and articulates, the idea of order as a hierarchical and sequential arrangement of elements in space is challenged. The change in perspective is directly related with the possibilities of representing the space of informal settlements.

Overcoming the imposition of order as a driving force that idealizes urban space is essential to understanding the city apart from the rationalist perspective. In the case of the interpretation of informal settlements, it is an opportunity to shed light on representations that go beyond foreign perspectives and go beyond the characterization of irregularity and precariousness, factors also related to disobedience to exclusionary norms. Order can be described “as the arrangement, layout, or disposition of objects or things in relation to each other defined by a set of rules, sequence, or systematic method of organization” (Jones, 2019, p. 46). It is a definition that suggests a static and deliberate result. When it comes to urban space, there is not necessarily a linearity from disorder to order.

There are theorists and authors who deal with urban space and seek to work with a concept of order that differs from more traditional definitions. Holanda (2013) argues that order is inherent and focuses on the configuration of any place that involves human work and perception in space. There are several types of order, which depend on each context and society and perform better or worse in responding to certain demands and have a greater or lesser repertoire of rules (Holanda, 2013). Hillier and Hanson (1984) conceptualize order as a set of rules that limit the movement of entities in a system. In urban space, this order establishes physical barriers and permeabilities that influence the movement of people. In the author’s Theory of Spatial Syntax, order defines the elementary relationships between physical entities, developing a complex space that interacts reciprocally with the social organization that occupies it.

Related to the concept of order, Dovey (2012) and Shafique (2021) resort to the idea of *Assemblage* (arrangement)² to recognize and explore the logic of space production in informal settlements. *Assemblage* refers to a whole that is created from the interconnectivity between its elements, each element assuming an identity based on its relationships within the arrangement. A territory is formed from a stable arrangement between elements and their relationships; every settlement involves an act of territorialization.

It is a fact that the idea of order in urban space has culminated in models of cities that are detached from their complex and dynamic reality. However, we must seek and discover the implicit and explicit logics that produce urban space and, in particular, informal settlements. After all, discovering space and seeing it in order to go beyond its vagueness is also an opportunity to validate it in light of the possibilities for the city’s production. Although the term “order”

2 *Assemblage* is a concept that comes from the philosophical thinking of Gilles Deleuze and Félix Guattari. Although it has been explored in several works, the elaboration of the concept of *Assemblage* can be found in the book *A Thousand Plateaus*, authored by both.



is used in some elaborations, the discussion presented above directs this work toward the investigation of what can be better defined as the organization and/or configuration of informal settlements. This configuration is seen as the set of rules that structures urban space and its development. It is mediated by the demands and formal repertoire of a social organization and by the spatial possibilities of the physical elements of a place.

Unlike a static order that is an end in itself, the configuration of a place is transformed through continuous interaction between society and space. To discover this organization, it is necessary to explore a diversity of representations that are not alienated from the parameters of order. Otherwise, there will only be positive and negative statements that dictate whether or not the space complies with the imposed order. To understand the configuration of informal settlements, we must face the challenge of discovering the rules of space production that are deeply rooted in everyday practices. It is in this sense that the field of urban morphology emerges, with a theoretical and methodological apparatus that articulates a diversity of representations of the city applicable to the reality of informal settlements.

URBAN MORPHOLOGY TO OVERCOME (DIS)ORDER

Urban morphology is the study of urban form as a product of the interaction between space and society over time, a reflection of political, social, and economic actions in the composition of the landscape (Costa and Netto, 2017). There are three basic components of the discipline: (1) form, physical elements; (2) scale of resolution, which investigates the relationship between elements under different groupings; (3) time, recognizing the processes of transformation of these elements and relationships (Moudon, 1997). Human settlements, beyond cities themselves, are complex and ambiguous organisms that can be understood from different points of view. Urban morphology is the field of research that investigates them from multiple approaches, using physical form as a reference object (Kropf, 2009).

The field of urban morphology emerged around the 20th century from two main theoretical bases: the British school, represented by geographer M. R. G. Conzen, and the Italian school, founded by architect Saverio Muratori. Conzen's historical-geographical approach analyzes the city as a palimpsest, an overlap of morphological periods, intervals of time in which social and economic transformations caused changes in the built form (Costa and Netto, 2017). The Italian school's morphological approach works with the idea of spontaneous consciousness, an internal knowledge linked to the cultural heritage of any individual who constructs space. Muratori investigates the typological process, identifying and classifying the transformations of a basic type (Costa and Netto, 2017). Another key approach is Spatial Syntax (Hillier, 2007), which aims to understand how society interacts and moves in space by analyzing free spaces (axial lines and convex spaces) and their level of integration with the system being



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analyzed. Finally, the analytical-spatial approach uses technological advances to build mathematical models that assess patterns of growth and segregation in cities (Kropf, 2009).

Among complementary approaches, Lynch (1960) also investigates urban form based on visual perception, and Berghauser and Pont (2010) based on the measurement of building density. Furthermore, Habraken (1998) investigates the built environment based on the recognition of agents and their hierarchical and dominance relationships in space. Under multiple representations of the city, which understand it as a complex organism, it is possible to investigate the urban form of informal settlements based on their socio-spatial identity (Spolaor and Oliveira, 2021). There are a number of studies that use different approaches to explore the reality of these territories (Cardoso *et al*, 2020; Shafique, 2021).

Through the study of different approaches in the field of urban morphology, Kropf (2009) argues that urban form, the object of study, must be unraveled into different aspects that find their point of intersection in physical form. Urban form encompasses physical form, the relationships between humans and physical elements, the flows of human and material resources, and temporal relationships. If the configuration of urban space is structured based on a set of rules and codes and is expressed in the elements and relationships of a given territory, the study of urban form as the interface between space and society can be used to investigate the organization of informal settlements through a range of possible representations.

A READING FOR INFORMAL SETTLEMENTS

The analysis of urban form in its broadest sense can reveal both the formal repertoire of a society, its organization at the semantic level specific to the cultural, economic, and historical context, as well as the spatial possibilities of physical elements, that is their organization at the syntactic level³. Unraveling the identity of informal settlements requires an understanding of their urban form and the coordination between the elements and relationships that governs it. To discover the logic of the organization imprinted on the urban space of informal settlements, a deep understanding of the existing socio-spatial, economic, and cultural dynamics is necessary, processes that differentiate them from other parts of the city.

Beyond identifying problems and shortcomings, there are many studies that delve deeper into the reality of informal settlements, developing representations from other perspectives. These territories are based on collective agreements, regulatory elements that combine the urgency for housing and the financial capacity of families (Nisida, 2017). Individual and collective actions alongside processes of

3 The perspective of the syntactic and semantic organization of the relationship between space and society comes from Bill Hillier and Julienne Hanson in the book *The Social Logic of Space* and from Frederico de Holanda in the book (10 Mandamentos da Arquitetura, 2013).



transformation of the city itself, such as major decisions on development, place informal settlements in a continuous state of “becoming” (Jones, 2019).

Unlike the formal city, the house plays a central and fundamental role in the configuration of these territories, as it connects the family with its needs and with the space (Motta, 2016). The house, in its material characteristics, can express the passage of time in the favela (Cavalcanti, 2009). In the same scenario, the street can be understood as an extension of housing, enabling the construction of bonds of mutual aid (Holanda, 2013). The bibliography explored here, even when referring to specific territories or regions, attests to the uniqueness of the production of space in informal settlements and demonstrates possible paths for exploration beyond the problem.

The readings of the reality of informal settlements that deepen, and now confront, the “view from above” distant from the field subsidize the process of systematizing elements and relationships that indicate a structure of urban space. In this sense, three corresponding dimensions of analysis of the same object must be articulated: (1) The basic structure of the urban form, which systematizes the agents, elements, and relationships that make up the dynamics of space production; (2) The house as the nucleus of the urban form, understanding its weight in the definition of public and private spaces and in the dynamics of family relationships; (3) The aspects of physical form, which exist in mutual correspondence with the first two dimensions. The intention is that, when combined, the three dimensions can indicate correlations imprinted in a complex and dynamic arrangement to the point of revealing a logical structure for the formation of urban space. The correspondence between urban form in its broad sense, the state of the house, and physical form is defined precisely by the configuration of informal settlements.

The method proposed here requires visualization; the scheme functions as an instrument for systematizing the elements and relationships to be investigated. For the investigation of the structure of urban form, the basic components are spatial elements—physical objects located in space—and immaterial elements—objects and concepts that transcend space—their relationships, the interactions between agents that articulate themselves based on these elements and relationships, and, finally, the effects that are the result of the entire arrangement (Figure 1). The choice of these entities is based both on the discussion that defines and differentiates the configuration of space and order, and on the arrangement of aspects of urban form presented by the discipline of urban morphology, in particular the indications of Kropf (2009). Also, understanding the dynamics of informal settlements, territories mediated by a profusion of agents, guides the highlighting of this entity in the scheme.

What is interesting here is that, in many cases, what is perceived of urban space at first glance are its effects. Precariousness and irregularity can be considered effects of the arrangements that are drawn in the territory of the informal settlements. By systematizing the basic structure of urban form, it is possible to give more



centrality to the elements, relationships, and interactions between agents that shape space in place of effects.



Figure 1: Entities of the basic structure of the urban form (Guimarães, 2024).

Figure 2 presents an example of how the visual scheme that analyzes the basic structure of the urban form of settlements can be developed based on the previously presented bibliography. Urgency as an immaterial element establishes a relationship of necessity with regard to the house, a spatial element. This first arrangement already suggests the interaction of multiple agents indicated in the scheme and can cause spatial and immaterial effects such as housing precariousness or the creation of a local formal repertoire. Everyday life as an immaterial element, which is established through exchanges between individual actions of families and dynamics of mutual aid, and also places needs on the house. For the territory of informal settlements, the house determines a relationship of imposition on the street, which, in turn, differs from the surrounding area, has a relationship of exchange with community life motivated by agents such as youth and women, and this arrangement causes the effect of a unique urban experience in the space of the settlements.

Urban legislation can assume a role as an immaterial element within the structure, establishing a relationship of exchange mainly with the street, the road system. This design also includes the interaction between different agents who sometimes enforce the law, such as the State, and sometimes negotiate with the law, such as residents, NGOs, and resident's associations. At the bottom of the diagram, there are elements that refer to different notions of the same section of space. Territory is an element that concerns the divisions of power that exist in the occupied land, while the site defines the physical, geographical, and environmental conditions of that land. Urban interventions that occur mainly in consolidated settlements can establish a relationship of imposition with the site, causing transformations in the space of these territories.

The investigation of the basic structure of the urban form of informal settlements based on a visual diagram is the first of three exercises necessary to articulate an integrated view of the dynamics, processes, and physical characteristics that develop the urban space of these territories. Figure 2 develops one of several



structures that can be constructed from the observation of a specific settlement or group. This first diagram can be simpler or more complex, and can also depict different times in the same territory. A settlement in its early stages may present a reality with fewer agents, elements, and relationships, but as it consolidates, the diagram transforms into a more complex urban structure. The methodology proposed here can also mediate analyses of specific dynamics rather than the general structure. For example, one can focus only on the arrangement between streets, surroundings, and urban legislation and dissect this arrangement by adding more elements and relationships. The important thing is to construct a scheme capable of perceiving the entities of the system beyond the effects on space.

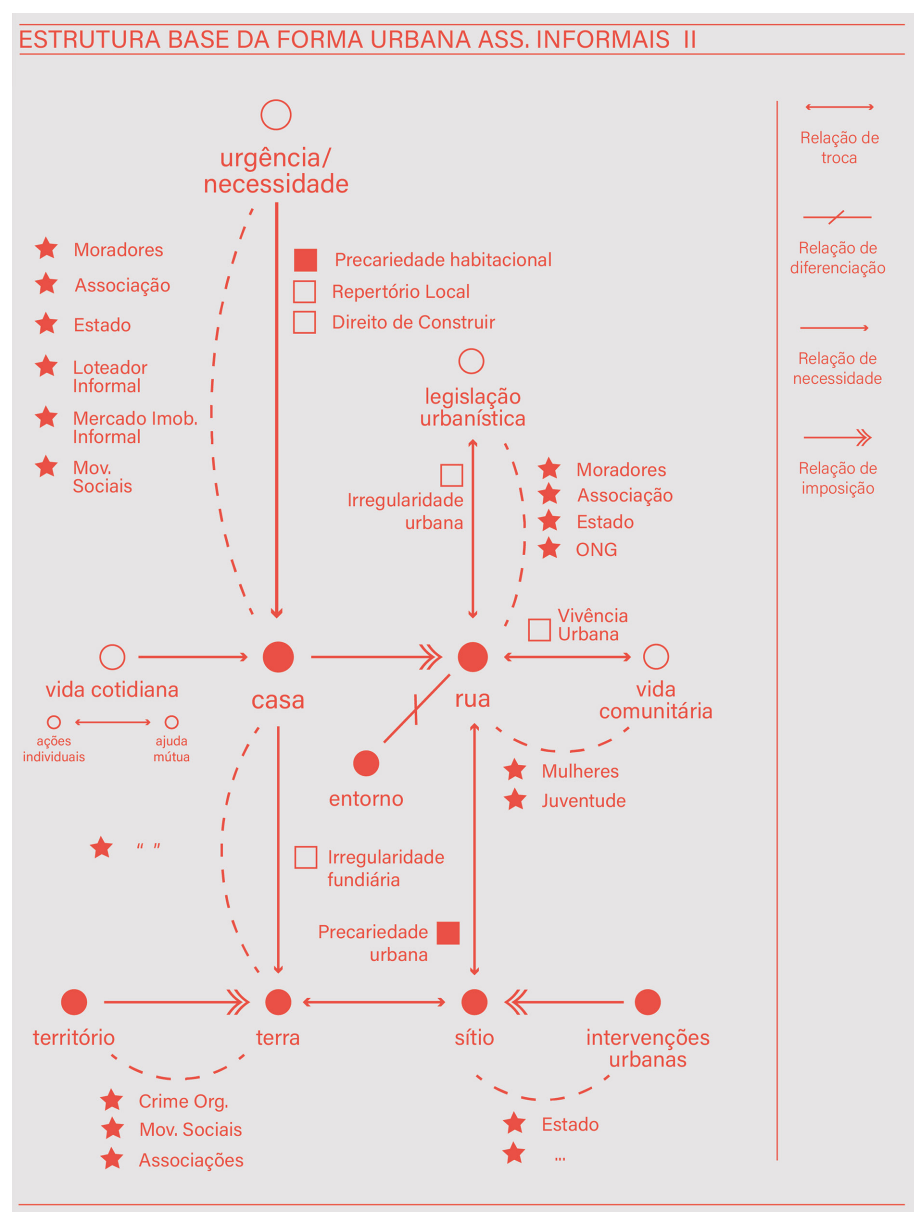


Figure 2: Basic Structure of the Urban Form of Informal Settlements (Guimarães, 2024).



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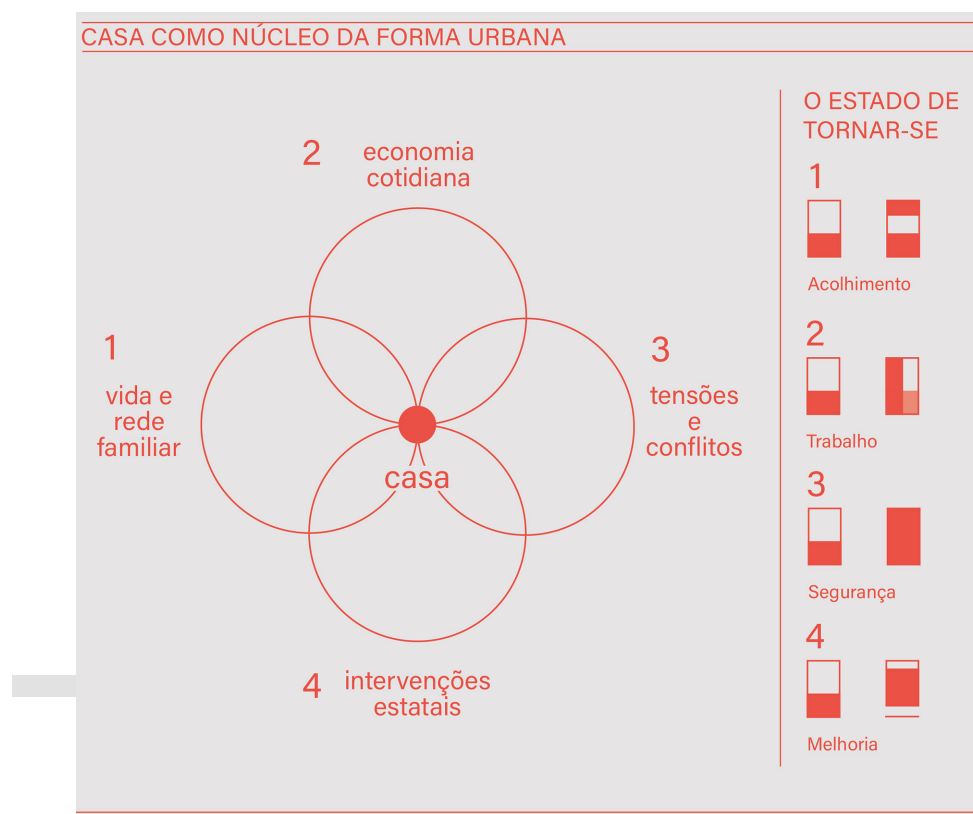


Figure 3: House as the Core of Urban Form (Guimarães, 2024).

The second dimension of analysis of the reality of informal settlements, considering the objective of uncovering their spatial configuration, is that of the house as the nucleus of urban form. Figure 3 places the element of the house at the center of four domains: (1) that of life and the family network, which corresponds to the family ties that demand the space of the house; (2) that of the daily economy, which concerns the financial needs and possibilities of the family that influence the constructive transformation of housing and the existence of mixed uses; (3) that of tensions and conflicts, which can impose security and insecurity on the house given social relations; and (4) that of state interventions, which can interfere in the house through the arrival of investments and public policies. This dimension of analysis is based mainly on the studies by Cavalcanti (2009) and Motta (2016), and each of the four domains is closely linked to the different occupations of the house on the lot and in the space in general and to its construction characteristics. The analysis of the house as the nucleus of the urban form is fundamental, since informal settlements are formed based on the need for access to housing.



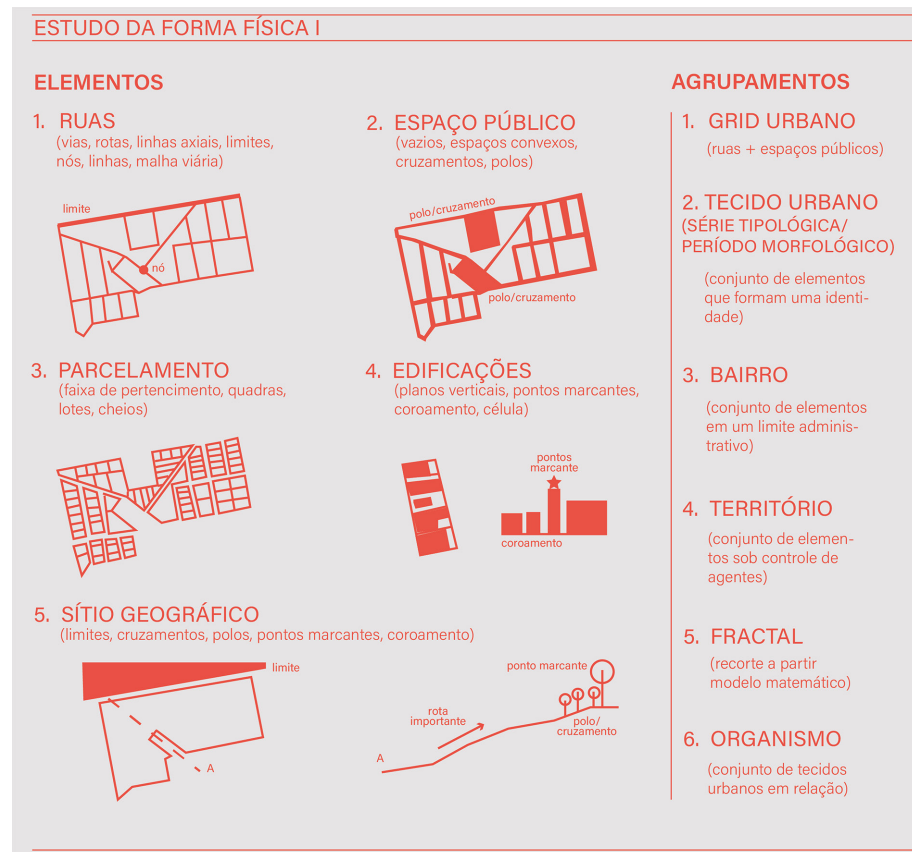


Figure 4: Study of Physical Form I (Guimarães, 2024).

The third dimension of analysis is the investigation of physical form *per se*. As already mentioned, physical form is the reference property of the study of urban form (Kropf, 2009). Beyond the theoretical contribution that fed into the construction of the panel's proposal, it is in this dimension that the methodologies and tools specific to urban morphology can greatly contribute to the investigation of the organization of urban space in settlements. Figures 4 and 5 provide a summary of the main elements, groupings, and relationships of physical form based on an extensive reading of the leading theorists in the field of urban morphology (Guimarães, 2024). In the previous section of this paper, which deals directly with the approaches of the discipline, most of the bibliographies that fed into the summary were presented. For the physical form dimension, there is a catalog of physical elements and relationships that can be observed and articulated with the first two dimensions, and which have potential for interpreting the space of informal settlements beyond simply stating the problems. This third moment is not strictly a methodology for data collection and information gathering; the physical form entities cataloged by the synthesis can be studied in light of different approaches to urban morphology. What is indicated is an organization of information and interpretations based on predetermined elements and relationships.



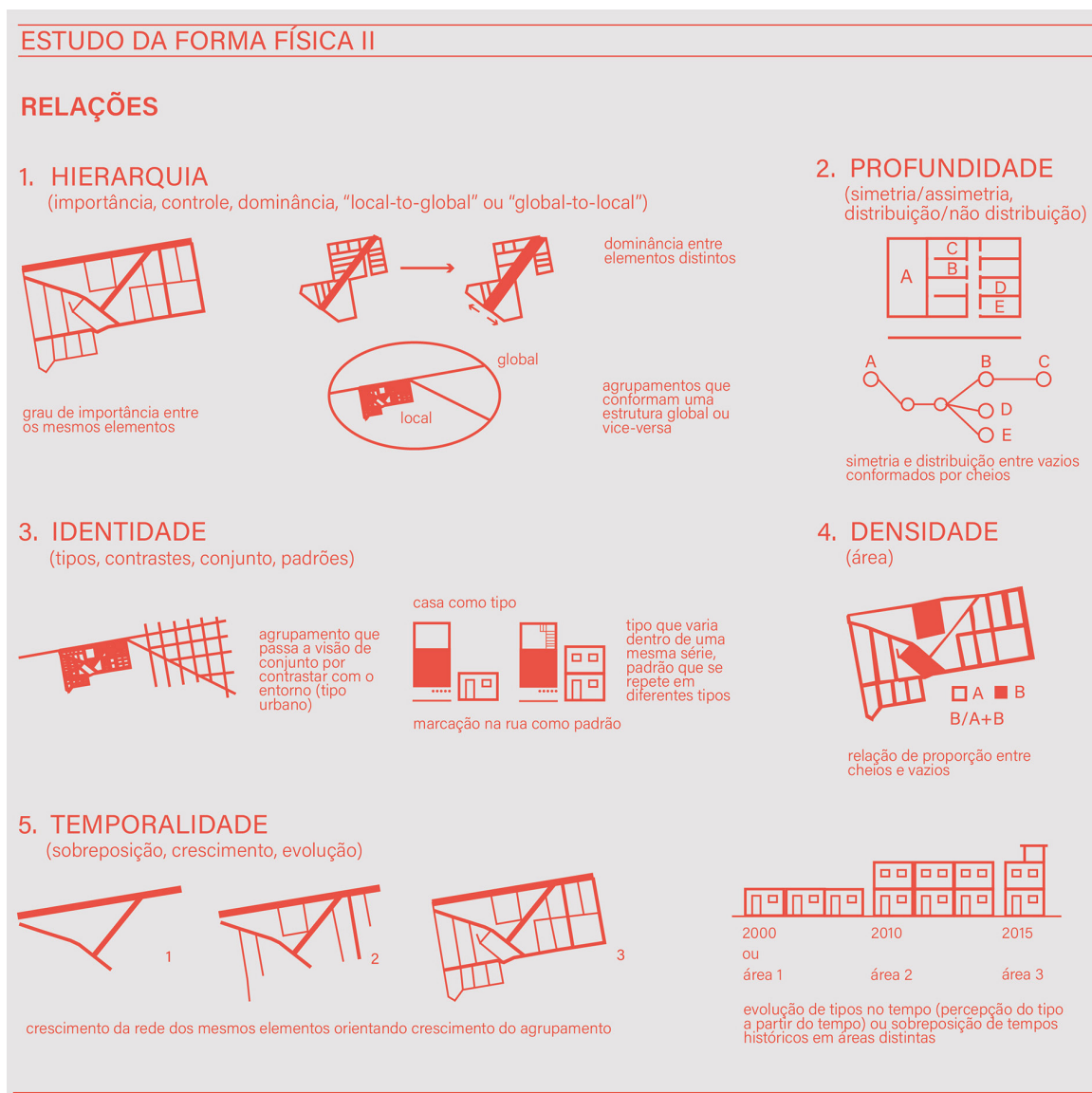


Figure 5: Study of Physical Form II (Guimarães, 2024).

The three dimensions of analysis are brought together through the construction of a panel that integrates the visual diagrams. Schematization is an exercise in representing reality that allows the observation of relevant details to answer scientific questions and guide investigations (Costa, 1998). The panel is both a method and a tool to guide a visual and multidimensional reading of urban space, a cognitive instrument capable of contributing to understandings related to the rules and codes that govern the spatial configuration of settlements. The organization is revealed through a holistic understanding of the basic elements and relationships of the composition of space. Figure 6 presents a panel as an example; it is a schematic portrait of an informal settlement in the city of Caucaia, state of Ceará (CE).



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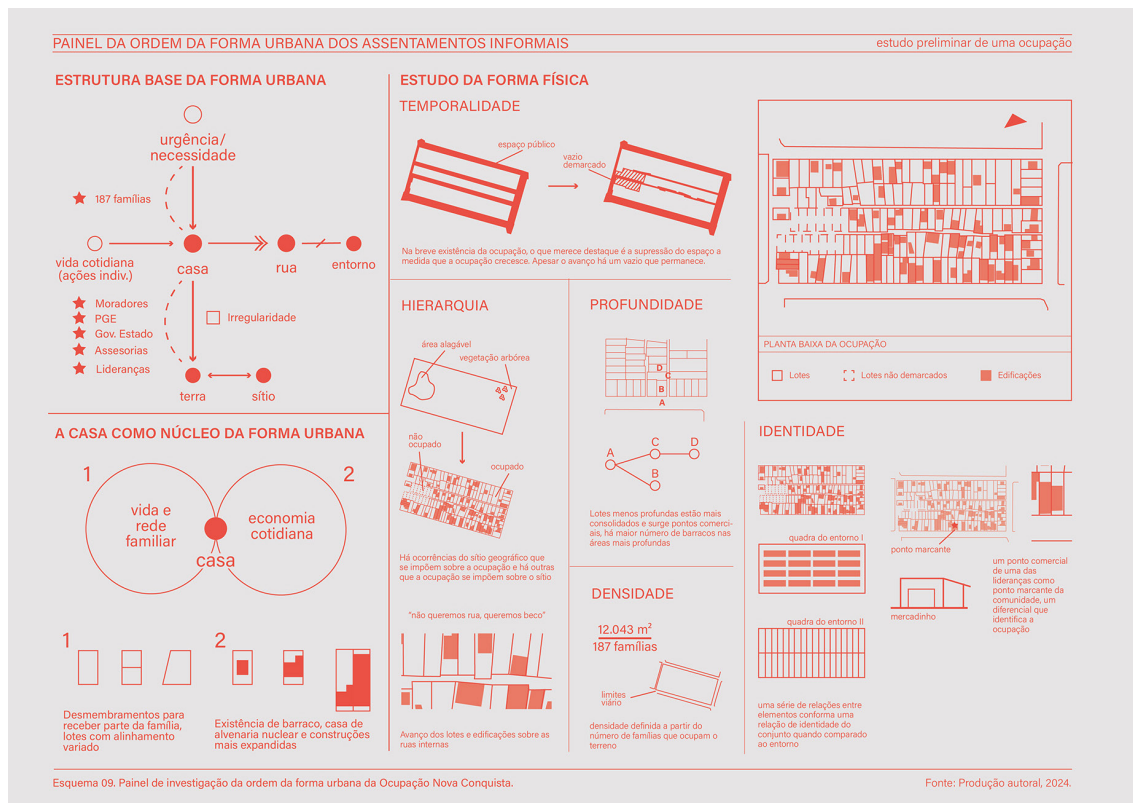


Figure 6: Panel of an occupation in Caucaia-CE (Guimarães, 2024).

Through the construction, visualization, and interpretation of the panel, it can be understood that, in the case of the settlement investigated, the urgency for housing, the diverse financial conditions of families, the limited land, and the absence of social movement in its initial period (the moment corresponding to the analysis of the panel) promoted a space of lots of different sizes and the suppression of internal roads. The larger lots on the edges of the land also have mixed uses, demonstrating the role of the house in the daily economy and the preference of families with greater financial means for lots that are more integrated into the urban fabric. The conditions of the site made it difficult to occupy a specific portion of the block. The need to include 187 families in the same space pre-determined the construction density of the land. At the time of the panel's preparation, the arrangement between the agents—residents, the state, leaders, and groups accompanying the occupation—the house and the land began to become more complex, which could put pressure on the elements of the physical form.

This is one example of perception among many that the panel can help articulate. The tool models the information absorbed by different sources and formats to enable the visualization of structures and arrangements relevant to understanding the reality of the informal settlements and, consequently, their configuration. The scheme encourages the necessary perspectives for an analysis without ready-made conceptions of order and disorder. The territory can be observed at different times, following its transformation, through the construction of other



corresponding panels. Investigating the organization and configuration of informal settlements—parts of the city that differ from the parameters of the hegemonic norm commonly associated with the ideal city model—is an exercise that aims to validate their urban form by analyzing their parts.

FINAL CONSIDERATIONS

Urban planning as a practice that thinks about and intervenes in space requires processes of investigation, diagnosis, and analysis of the territories that surround it. Informal settlements, in turn, are parts of the city that, while overlapping problems, present a unique dynamic that becomes incomprehensible under the lens of the current normative system. Urban and land irregularities, while characterizing them, limit the possibilities of representing the reality of these territories, affirming historical processes of spatial segregation.

Developing readings for informal settlements that overcome the impression of “disordered space” is a way for urban planning to think about these places based on their structure and logic of production, and not just on their list of problems; hence the need to focus on the organization of the urban form of informal settlements as an entity that can be unraveled. In this sense, the field of urban morphology provides a framework that allows for the analysis of the elements and relationships of urban form, and understanding these aspects can reveal the configuration of informal settlements. Based on other representations, the validation of these territories, recognizing their logic and organization, is an important step toward interventions and proposals for transformation that connect to the dynamics of the place.

The panel developed here is a methodology, since it proposes the articulation of three dimensions of analysis; and a tool, since it constructs visual schemes. It functions as a cognitive instrument that contributes to the identification of aspects of the urban form of informal settlements and the processes that articulate them, proposing an integrated view. The proposed representation exercise is especially useful when dealing with territories, such as informal settlements, with an organization so rooted in everyday practices and so dynamic, far from preconceived technical guidelines.

Although the work was limited to demonstrating an example of application, the panel enables a range of analyses capable of comparing different temporalities of the same settlement, or even different territories based on the same analytical structure. In addition, it accepts different methods and approaches to data collection, proposing a way to systematize and organize information in favor of a holistic view that interconnects entities. To admit a logical structure of its own in the urban space of settlements is to admit that one can plan and intervene beyond the eradication or mere acceptance of the problem.



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