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REPRESENTAÇÕES ESPACIAIS PELO USO NA MORADIA TRADICIONAL AMAZÔNICA
SPATIAL REPRESENTATIONS BY THE USAGE IN THE TRADITIONAL AMAZONIAN DWELLING
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PT | EN

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Abstract

This article presents an analysis of spatial relations in traditional Amazonian stilt houses, situated in the Brazilian states of Pará and Maranhão, relying on the patterns systematized by Christopher Alexander in Latin American dwellings in Peru. We conducted qualitative research using a systematic observation technique. The similarities in spatial representation based on the use of the built environment were identified in the analyzed houses, providing evidence of the uniqueness of each place in the configuration of spaces and their representations. The identified aspects have potential for the instrumentalization of design practices, considering that such solutions appeared as typical aspects of Latin American houses, in general. They also illustrated the particular way in which the Amazonian people produce, use, and spatially relate to their housing. This knowledge is of great relevance to the field of architecture, considering that the plurality of Latin American spatial representations requires attention to information regarding local practices. The focus of territorialization in studies on Latin American housing highlights the recognition of the existence of native elements carrying significant content that may not be contemplated by hegemonic architectural thinking.

1   Introduction

Design processes and operations comprise a field of knowledge that is still little explored in architectural education, compared to the predominant methods used in architectural design teaching in Brazilian schools. Their interpretation of the complexity and dynamics of everyday life is rare. Therefore, the theoretical understanding of design practices involving the materiality and immateriality of architecture makes the project an object of epistemological investigation. According to Malard (2006), design is determined by the culture, people's way of life, and their surroundings. That is, it is specific to each culture and congruent with the social organization of that group. It depends on the knowledge and reflection about the spatial needs of the inhabitant and the context of culture insertion in the natural and built landscape.

These spatial needs are related to the physical characteristics of the building, the way the residents understand the spaces of the house, and to the social and cultural context of use of this architecture, represented in the rooms. This spatial representation, according to Perdigão and Bruna (2009), is a guiding principle of the design process interpretation of the architectural environment by experience. The Amazon stilted habitat, in the context of traditional communities, becomes a valuable empirical reality for decoding the mechanisms used to produce the built environment without architects. The observation and survey of actions *in loco*, especially regarding the transformations and adaptations made by the residents, contribute to strategies, without underestimating the involved complexity, to produce formal knowledge in the field of architecture directed at the training of the architect and their performance.

This professional activity is done with systematized technical and theoretical knowledge that understands the relevance of incorporating variables of a spatial and sociocultural nature into the process (Del Rio, 1998), leading the professional to a self-reflective posture concerning their decisions (Oliveira, 2010). The need for the designer to commit to the suitability of the architecture to the living space, established by the user, also applies to Amazon. The manner in which Amazonian inhabitants relate to nature influences the way they relate to their own house. The professional must understand the spatial representations established by the inhabitant during the living process and identify the peculiar elements of spatial use in that daily life as guidelines for the design process of a place's traditional housing.

The description of how the traditional Amazonian inhabitants understand and produce housing spaces, motivated by use, is the guiding component of this research. For this purpose, we considered the production of traditional stilt houses in the Amazon Biome, in the area delimited as Brazilian Legal Amazon, in traditional communities in the states of Pará and Maranhão, in a region historically and culturally recognized for the existence of stilt houses. This study used qualitative research and systematic observation techniques in which the identified aspects were guided by patterns of use systematized by Alexander et al. (1969). We sought to identify how these patterns manifested in and applied to the traditional Amazon way of life, considering what would be homogeneous and what would be unique as a result of the investigation, to broaden the understanding of Latin American living and housing. The result highlights the homogeneous design variables concerning Latin American houses but also the peculiar way in which they manifest themselves, depending on the cultural, social, and natural context of insertion.

2   The tradition of living on stilts in the Amazon

The Amazon is a territory with diverse manifestations of a "complex social-ecological system" (De Las Casas, 2019, p. 156, our translation). Because the Amazon extends over nine Latin American countries, actions there affect those countries and their Latin American neighbors (Aragón, 2018), justifying the importance of understanding the region. However, this region can only be understood by integrating knowledge about the human beings who inhabit it and the nature that encompasses it and clarifying the already established harmonic relationship between the two elements (Paes Loureiro, 2015). This linking of human life in harmony with the surrounding nature is reflected in the use of natural resources with respect to nature's seasonality (Stoll et al., 2019), practices learned in daily life, and characteristics of family economic activities based on social knowledge (Loureiro, 1992).

De Las Casas (2019, p. 156) considered the Amazon Biome "one of the main components of the social-ecological system, the Amazon, understood as an analysis and management unit." In his work, he highlighted the importance of the Amazon in the world stage and the necessary integration of political actions dedicated to this territory. The Amazon Biome has a complex social-ecological system, requiring approaches that consider the cultural landscape and the transformative role of the culture of the men and women who live in the forest.

On a global scale, the biome is present in French Guiana, Suriname, Guiana, Venezuela, Colombia, Ecuador, Peru, Bolivia, and Brazil (De Las Casas, 2019). The latter comprises the largest extension of what is called the Brazilian Legal Amazon (Figure 1), consisting of the entire territory of the states of Acre, Amazonas, Roraima, Amapá, and Pará, a large part of the state of Rondônia, and in smaller extensions in the states of Maranhão, Tocantins, and Mato Grosso (Veloso, 2020).

Fig. 1: The Amazon Biome and Brazilian Legal Amazon. Source: Veloso, 2020. Elaborated by: Francisco George Lopes/Secom UnB, modified by the authors, 2021.

Because of the changes that have occurred since the Industrial Revolution, an Amazonian approach with a focus on humane has become relevant, given the necessary elucidation, recording, and insertion in the scientific field of intrinsic factors to human activities that structured the traditional culture of Amazonian housing. Communities formed by people who share ancestral beliefs and a common way of life, maintained by inherited knowledge and the way they inhabit the territory, are characterized as traditional (Lifschitz, 2011). In the Amazon Biome, traditional communities are established by stilt houses. They possess a tradition that has remained apart from the influence of other places in Brazil and Latin America and have established a peculiar and different way of life (Paes Loureiro, 2015). The houses are built using inherited knowledge about water flows, which establishes their tradition in the daily relationship between the house and the natural surroundings and configures what Menezes (2015, p. 108, our translation) identified as the "Amazonian stilt house type."

This way of living on the water has existed since the pre-colonial period, when they were called stilt-house settlements, because they were houses suspended by tree trunks, that is, by struts (Navarro, 2017). According to the author, the choice of dwelling over the water was made at that time, both for cultural reasons and for protection against the possibility of enemy attacks. Archaeological studies on stilt-house settlements in eastern Amazonia have identified a greater number of stilt houses on the coast of Pará, near Marajó Island

(PA), and on the coast of Maranhão, in the Turiaçu River region (Navarro, 2018). For this reason, we considered it relevant to carry out the study of traditional Amazonian stilt houses in these locations, specifically on the coastal strip where the Marajó Island and the mouth of the Turiaçu River.

In Pará, traditional Amazonian housing was established based on the close relationship of the "natural man of the Amazon" (Loureiro, 1992, p. 16) with the rivers, thus presenting a territorial occupation that followed the course of the waters (Trindade Jr., 2012) and featured the Amazon riverside way of living. Cruz (2008) considered this way of life as the most typical of Amazonian populations and regional culture, which has the river as an important denominator of the choices that people make about their housing and way of living. Their buildings are made of wood from the region and, respecting the variation in the river water level, are built on stilts (Figure 2).

Fig. 2: The traditional Amazonian dwelling in the Pará state. Source: Castro, 2019.

The relationship between housing and the Amazon natural environment in Maranhão is different from that observed in Pará, as it occurs on the riverside but away from it. The daily life of the house relates to a surrounding area that is flooded only at certain times of the year, in a part of the Amazon Biome with an upland ecosystem. Nevertheless, the residents built their houses on stilts, respecting the advance of the waters, with no access by stowage (Figure 3). This reality evidences a plural and diverse context, with spatial and territorial particularities defined by daily experiences (Trindade Jr., 2012). According to Castro (2019), the Amazon presents floodplain, mangrove, or upland ecosystems, which demands an understanding of the daily life of the rivers, lakes, streams, *igapós*, and tides of which they are composed.

Fig. 3: The traditional Amazonian dwelling in the Maranhão state. Source: Burnett, 2020.

Valuing aspects of a given place is an important practice in the design process. Menezes (2015) reported the process of housing adaptation of residents relocated to the Vila da Barca Project in Belém, Pará. Coming from a riverside community, they made modifications to the house they received in a "rescue of the Amazonian stilt house type" (Menezes, 2015, p. 108). Another example is the Taboquinha project (Paixão, 2019), district of Icoaraci, in Belém, as housing adaptation led to the rescue of the "house of origin" in terms of its physical and spatial relations. Evidencing the relationship between theory and practice in professional performance, which values sociocultural aspects, Perdigão (2003) presented a "flexible architectural proposal" applied to a relocation process that valued "typological de-standardization," providing people's identification with the new dwelling. Perdigão (2019) highlighted the potential of information from Amazonians living in the formulation of theories of architectural production because the characteristics of the local way of inhabiting and the spatial experience are pertinent information in the design process concerning the location.

3   Analysis categories of spatial representations by housing use

The area encompassed by the Amazon Biome extends over nine Latin American countries; however, this study on living was focused on the Brazilian Legal Amazon region, more specifically, on insular coastal communities in the states of Pará and Maranhão. We aimed to highlight solutions that reflect the way people relate to their dwellings by interpreting the spatial representations established by the users of each place in the daily use of the Amazon traditional stilt house. To carry out the study, we assumed the use of qualitative research, collecting data from the observed natural context, according to Groat and Wang (2013). The technique used in the field was systematic observation (Gil, 2008), as the aspects observed were previously established and based on the research objective.

To substantiate the aspects observed and the categories of analysis applied, we considered the studies and systematizations by Alexander et al. (1969), Alexander et al. (1977), and Alexander (2002). These authors reported representations in buildings and systematized elements that were the essence of the "life" of these places. For them, this "life" is the identifying attribute of quality in a building. However, it only emerges from people's actions in space. Alexander et al. (1977) paid special attention to traditional architecture by understanding people's ability to supply their own spatial needs. Alexander et al. (1969) emphasized the importance of valuing the identity aspects of a place, as exemplified by their propositions, considering the way of life in Lima, Peru. In the proposal and execution of their *Proyecto Experimental de Vivienda*, they preserved what they called the "idiosyncratic needs of the individual families who buy the houses" (Alexander et al., 1969, p. 6).

The authors identified that the dynamics of the use of spaces had a pattern of language derived from repeated actions that occurred in the daily life of the places (Alexander et al., 1977; Alexander et al., 1969). They systematized them as prior instructions for such spatialities, considering their refinement when applied to other contexts. Later, Alexander (2002) published 15 fundamental properties to be considered to achieve "life" in designed structures. On this occasion, he related to them the language patterns, as "functional notes" applicable to the design process. Among those identified by the author, gradient property was used in this study. For him, it evidenced a natural response to situations of change in space, adapting to them. The patterns selected as analysis categories and which are related to this property were the "transition space" (Figure 4) and the "intimacy gradient" (Figure 5).
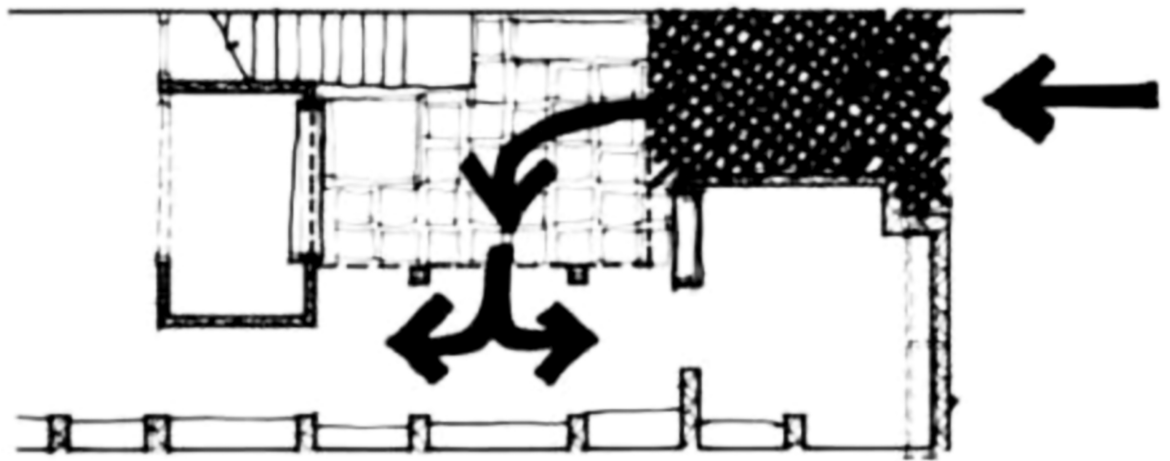

Fig. 4: Transition space. Source: Alexander et al., 1969.

Alexander, Hirshen, Ishikawa, Coffin and Angel (1969) described it as recurrent in Latin American dwellings, a gradient of intimacy that begins in the less private rooms at the front of the house and proceeds to the most intimate at the back (Figure 5). The authors considered it essential for these houses to have a room immediately after the entrance, as people establish different levels of proximity among themselves, from casual acquaintances who do not even enter the house, to the closest ones, received in the kitchen. The aspect related to the transition space between the street and the house's internal environment was described by Alexander and colleagues (1969) as a pattern applicable to any house that may appear in several ways, through changes in elements such as the view, light, level, surface, sound, scale, or any action that interrupts continuity. Therefore, aspects to be observed in the field were established regarding the fact that the intimacy gradient indicated fewer private rooms in the front of the house and more private rooms in the back and how the transitional space occurred in the studied communities. These elements help in understanding the characteristics of different places by recording the spatial relationships produced in the experience.
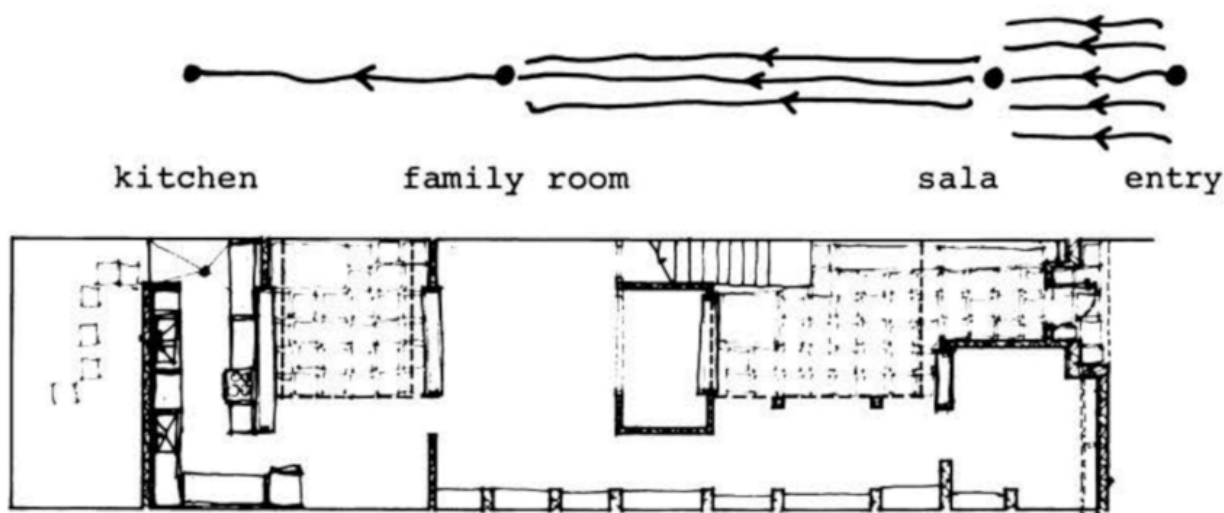
Fig. 5: Intimacy gradient. Source: Alexander et al., 1969.

4   The use of the traditional Amazonian stilt house

This section discusses the context of traditional stilt house use in the Amazon Biome, focusing on the identification of spatial solutions in two distinct ecosystems: floodplains and uplands. Understanding the spatial representations established by the residents contributes to highlighting solutions applicable to the place-oriented design process, evidencing the way they understand and relate to the house. We established as spatial representation analysis categories the patterns of "transition space" and "intimacy gradient" (Alexander et al., 1977; Alexander et al., 1969). The study contributes to the recording of homogeneous and peculiar elements of the culture of housing use in each place, as summarized in Table 1 and detailed in the following sub-items.

	SPATIAL SOLUTIONS OF THE TRADITIONAL STILT HOUSE IN THE AMAZON		
Spatial representation categories	**Ecosystems and context of housing implementation**		
	Floodplain, isolated from other houses	**Floodplain, near other houses**	**Upland**
Intimacy gradient	Front porch and kitchen in the back	Front porch and kitchen in the back	Kitchen in the back, no front porch
	Intimacy gradient begins at the docks	Intimacy gradient begins at the front porchl	Intimacy gradient begins at the front staircase
	Front porch as the first private room	Front porch as the first private room	Living room as the first private room
	Small kitchen for food preparation	Large kitchen for food preparation and for receiving friends and relatives	Large kitchen for food preparation and for receiving friends and relatives
Transition space	Physically delimited	Physically delimited	Sensorially and symbolically delimited
	Docks and stowage as transition spaces	Front porch as transition space	Change in texture and level as transition space
	Docks and stowage as private environment	Docks and stowage as public environment	Collective dock, far from the houses, without stowage

Table 1: Spatial solutions of traditional stilt houses in the Amazon. Source: Authors, 2021

4.1   Spatial representation by use in traditional housing in the state of Pará

In this study, the traditional stilted housing in the Pará Amazon was represented by houses located on Ilha das Onças, Pará, near Marajó Island, in a habitat-related to what Cruz (2008, p. 56) called "riverside culture." Their construction takes place on the riverbanks, the residents build houses and paths (stowage) in wood, and their daily lives obey the seasonality of the surrounding waters. With the floods and ebb tides of the rivers, this way of life is feasible in buildings on stilts, in a floodplain ecosystem, in areas that are floodable during most of the year. House 1 (Figure 6), according to Virgílio and Perdigão (2020), was built by people from the city of Belém, who had known riverside life since their childhood, which influenced their decision to leave the city and helped them choose a place to live. Conversely, the residents of House 2 (Figure 6) occupied a house that used to belong to their mother. In the surroundings, nearby houses were connected by wooden bridges, a common practice in areas where neighbors belong to the same family.

Fig. 6: Houses on stilts (House 1 on the left and House 2 on the right), Ilha das Onças, Pará state. Source: Collection of the Space and Human Development Laboratory (*Laboratório Espaço e Desenvolvimento Humano*), 2019.

Regarding the use of House 1, Virgílio and Perdigão (2020) reported that the porch and kitchen were the spaces most used by the residents. In analyzing Figure 7, we noticed the option of constructing a front porch and kitchen at the back. Although Alexander et al. (1977, p. 610) considered "a front porch or entrance room most public of all" spaces, in this case, because it is an isolated house, the stowage gives access to the house only to those who arrive by boat through the front part. The intimacy gradient begins at the dock and stowage, and only then enters the front porch, where visitors are received. For this reason, the kitchen is a small space dedicated to food preparation activities, and the intimacy gradient allows the front porch to be used privately.
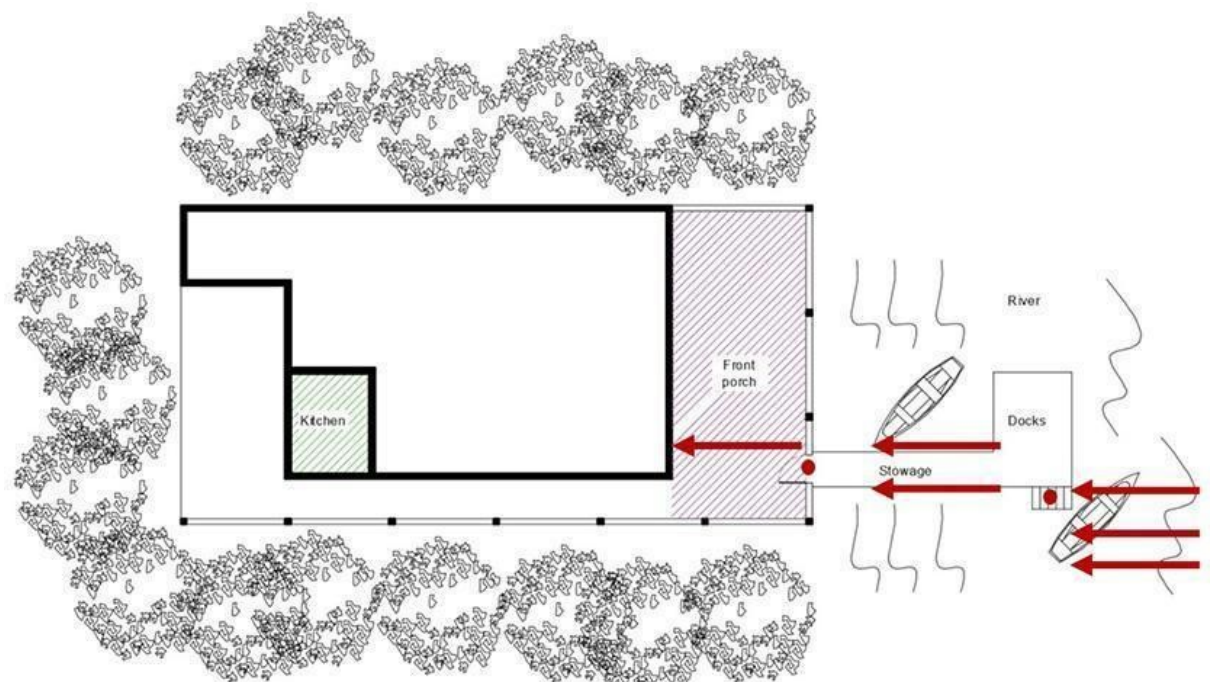

Fig. 7: Intimacy gradient, House 1, Ilha das Onças, Pará state. Source: The authors, 2021.

As for the transition space, according to Alexander et al. (1969) and Alexander et al. (1977), its creation is what guarantees a less abrupt arrival to the interior of the house. This demarcation, physical or symbolic, is related to the path between what is considered public and what is considered private. In the case of riverside life, in general, people have a relationship with the river that is much like the one land dwellers have with the street. They use it to move around to carry out their activities and to get to their neighbors' houses. Therefore, in House 1, the dock and front stowage are the transition spaces (Figure 8), as all visitors need to reach the house by boat because it is isolated from the other houses in the community.
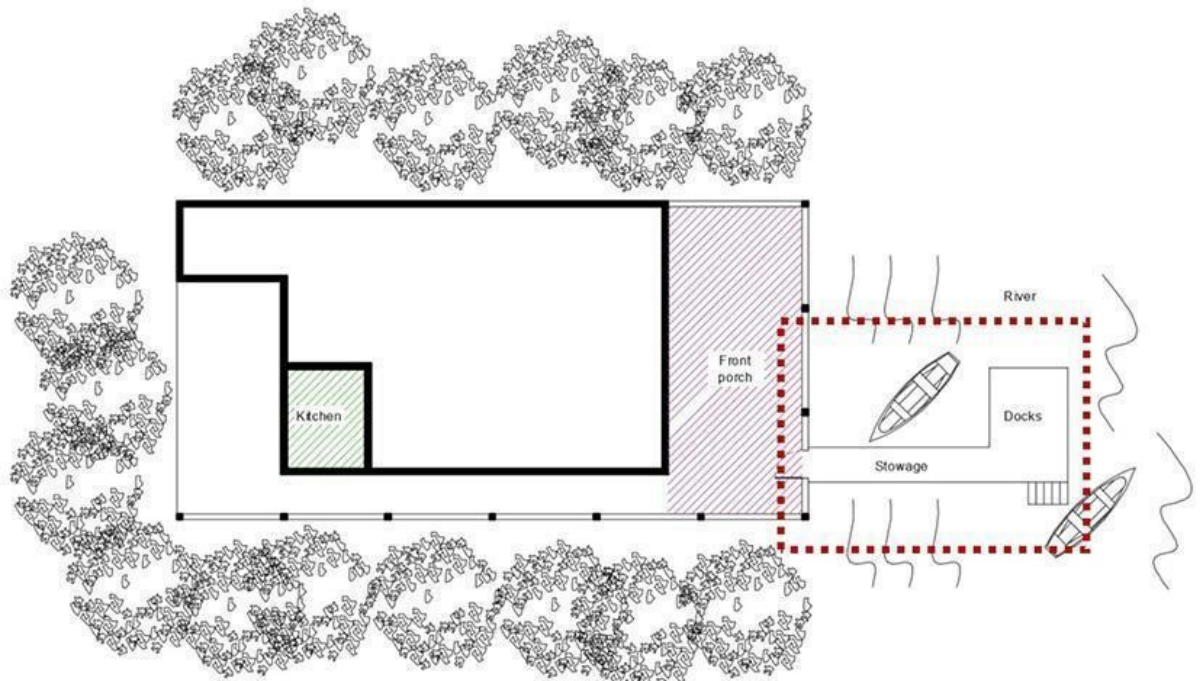

Fig. 8: Transition space, House 1, Ilha da Onças, Pará state. Source: Authors, 2021.

In the case of House 2, because it is in a context of proximity with other houses, as neighbors belong to the same family, it has access through stowage that connects the houses. In this context, the decision of the dweller about privacy control, instead of taking place in the stowage, starts at the access doors to the house, such as the front porch door. In this way, the porch is characterized as the most public room of the building, and the closest people to the family are received in the kitchen, which is in the background (Figure 9). This configuration resembles the one presented by Alexander et al. (1969) regarding houses in Peru, as the front space is delimited to receive more formal visitors, and this privacy control gradually decreases until the most intimate area of the house. Because it is an area for preparing food and receiving family and friends, the kitchen is larger than in House 1.
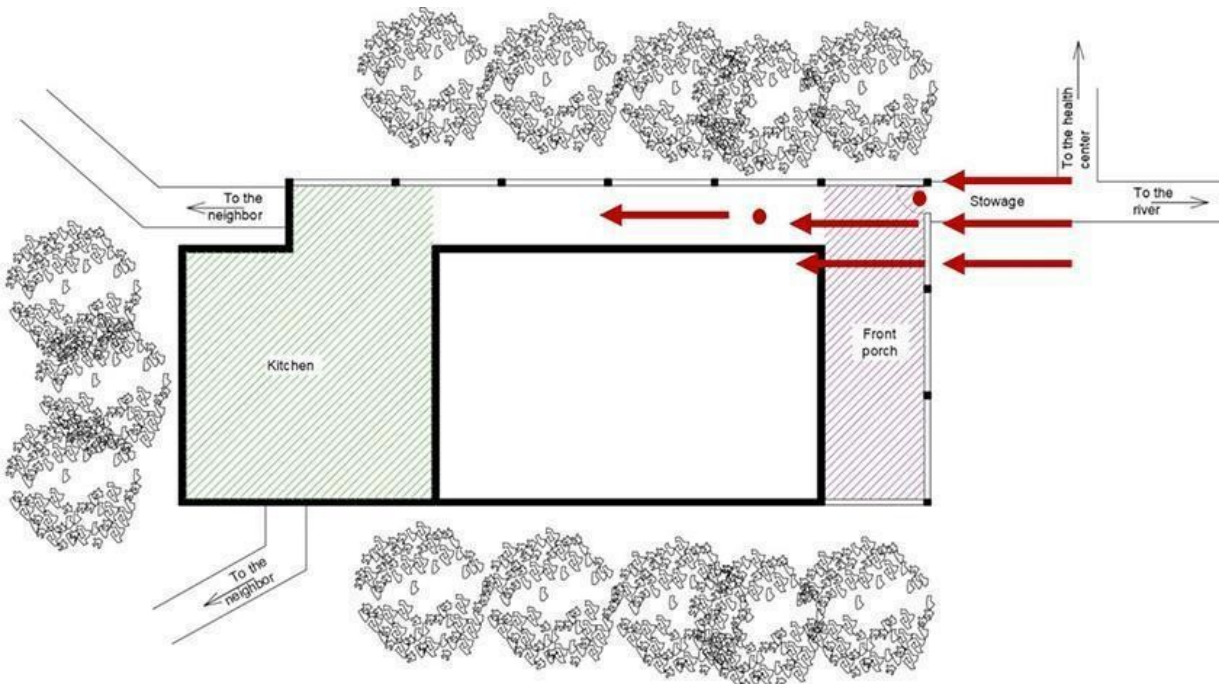

Fig. 9: Intimacy gradient, House 2, Ilha da Onças, Pará state. Source: Authors, 2021.

Because it is a house accessed by the front stowage and other stowages connecting neighboring buildings, House 2 has the front porch as the transition space. Unlike House 1, which is isolated, this proximity between houses establishes public paths through the stowage, and the transition space is internal to the house. This configuration also resembles the Peruvian house model presented by Alexander et al. (1969), in which there is a frontal space delimitation for this transition. In the case of the riverside dwelling, this space is the front porch (Figure 10). It serves as a gradual transition from an external environment to a house interior.
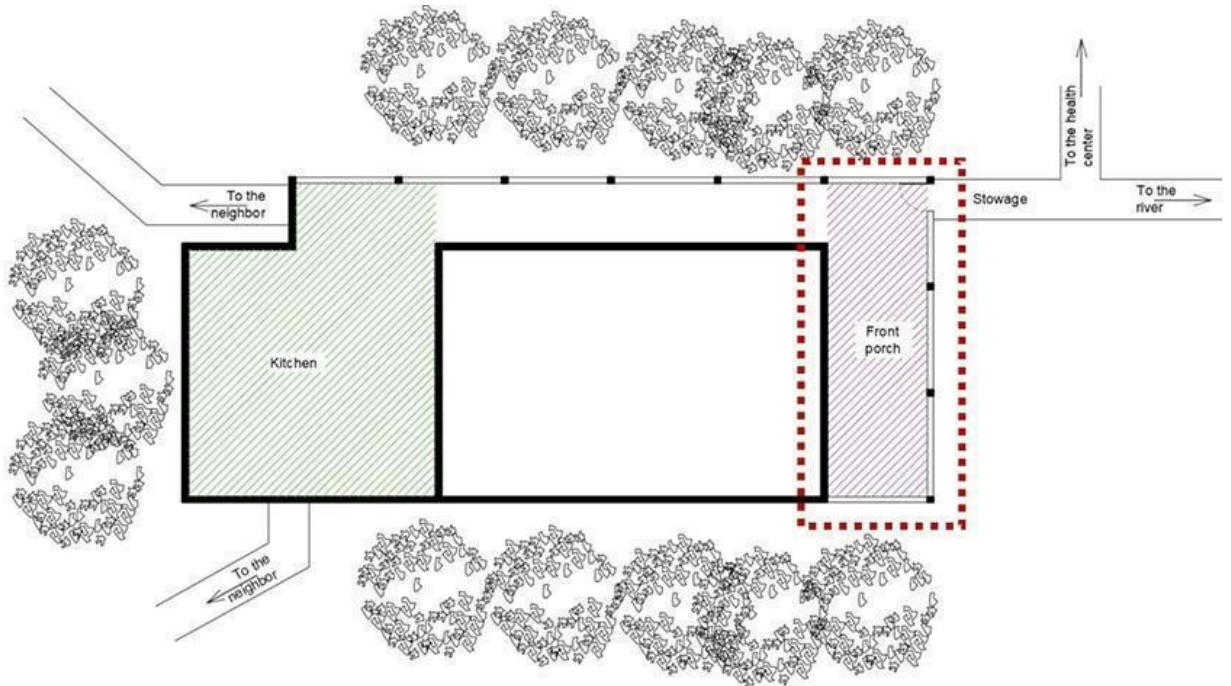

Fig. 10: Transition space, House 2, Ilha da Onças, Pará state. Source: Authors, 2021.

Concerning the human spatial needs of the traditional stilt house in Pará, we perceived two different contexts of building implementation: the first was represented by House 1, which was isolated from the other houses, and the second by House 2, in a network of houses belonging to the same family. In both cases, we observed the same positioning of environments—a porch in the front and a kitchen in the back—in relation to the building as a whole. However, the isolated housing established a gradient of intimacy that started externally to the building, in the stowage and pier, while the gradient of the house close to neighbors started on the front porch. This characterization influenced the configuration of the kitchen that, in the first case, was small and intended only for food preparation, and, in the second case, was configured, with the front porch used to control privacy and to receive visitors and family members.

4.2 Spatial representation by use in traditional dwellings in the Maranhão state

In traditional stilt houses in the Maranhão Amazon, a closer relationship with land is evident. They are far from riverbanks, entering land in search of solid ground, maintaining the relationship with the river in the construction of a single pier (Figure 11), for collective use, and far from other houses. There is an awareness of knowledge about the seasonality of the surrounding nature because the inhabitants build their houses suspended above the ground, at a height that matches the flooding periods to prevent the water from invading them. However, because they face long periods of drought and dry land, they do not build paths on wooden platforms, but use the land itself to access the buildings. These communities are constituted by stilt houses traditionally built on solid ground that coexist with shorter periods of flooded areas.

Fig. 11: Housing on stilts and a river access pier, Ilha de Sababa, Maranhão state. Source: Collection of the Space and Human Development Laboratory (Laboratório Espaço e Desenvolvimento Humano -LEDH), 2020.

Despite being a community that exhibits a similar geographic situation to the Ilha das Onças, in Pará—that is, in the coastal part of the Amazon Biome—decisions about housing in relation to the "transition space" differ, because in Sababa Island, Maranhão, the houses do not have front porches (Figure 12). The entrance door of the house is linked to the solid ground by a ladder, and the placement of palm leaves on the floor in front of the buildings is noteworthy. In this case, the transition space appears in the change in texture of the sidewalk, which leaves the dirt path toward a stretch with straws, and by the climbing of some steps to access the house. The straws in front of the house behave as a symbolic and sensorial space of transition, corroborating the statements of Alexander et al. (1977), who considered, for this pattern, any situation of continuity breaking. The authors also illustrated the transition caused by a level change in the path represented in this study by the stairs built in front of the houses.
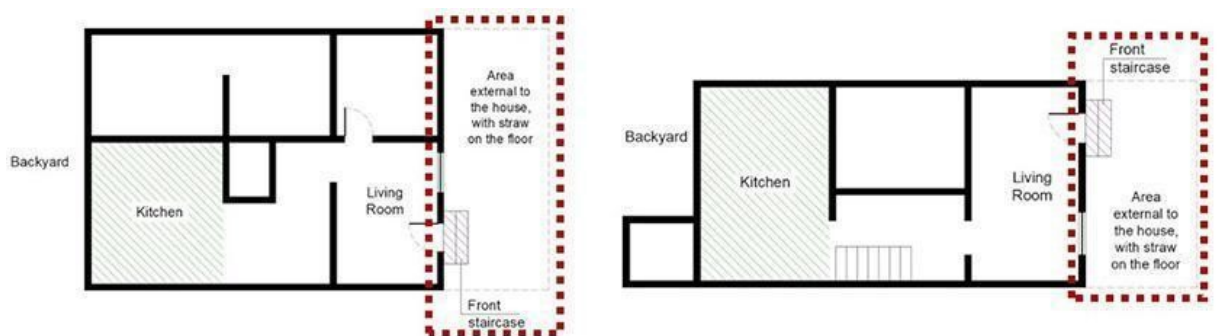

Fig. 12: Transition space, Sababa Island, Maranhão state. Source: Authors, 2021.

As for the intimacy gradient, the analyzed houses used the kitchen in the background as a private meeting place. It is built with larger dimensions to receive fewer formal guests (Figure 13). Because it is a spatial representation in which the house's internal environment is more exposed to the outside, owing to the absence of a front porch, the intimacy gradient begins at the front stairway, advances, and is established by the presence of a wall between the living room and the other rooms (Figure 13). This solution enables privacy control in relation to less intimate visitors, as it hinders the visual reach of the kitchen from both the living room and the front staircase. Alexander et al. (1969) reported a similar situation in Peruvian houses, where formal visitors were received in the social living room, separated from the rest of the house.
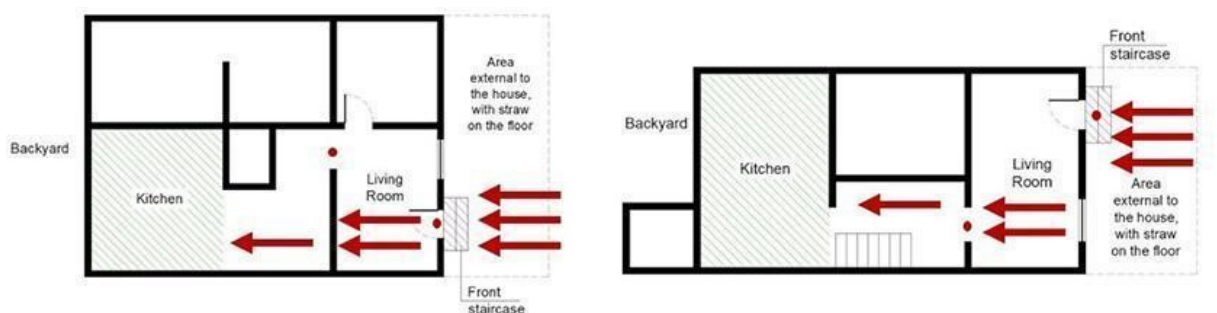

Fig. 13: Intimacy gradient, Sababa Island, Maranhão state. Source: Authors, 2021.

Regarding the spatial needs of the occupants of the traditional stilt house in Maranhão, we noticed that the house also followed the front and back configuration, with the living room as the front environment and the kitchen in the back. Although the houses were on stilts, the upland ecosystem allowed for paths on the ground, and access to the house was through the stairs at the front door. They were the most public element in relation to the other rooms of the house, followed by the living room, which, for the gradual advancement of privacy, was separated from the other rooms by a wall with an opening displaced in relation to the front door. The kitchen was the most private space intended for the reception of family and friends. The transition space was sensorially and symbolically demarcated by the placement of straws on the floor in front of the houses and by the unevenness in relation to the access door to the home.

5   Final considerations

The spatial experience of the house establishes representations structured in the relationships between people, architecture, and the sociocultural context. The analysis of spatial representations based on traditional Amazonian housing, language patterns, and fundamental property, was systematized by Alexander et al. (1977) and Alexander (2002). This method showed potential for instrumentalizing the process from categories related to human spatial needs in the Amazonian context because it allowed for the development of a design understanding of how the patterns represent the everyday uses practiced by the residents.

The traditional communities studied in the Amazon Biome were in different ecosystems, including wetlands and uplands, but presented the same decision regarding the construction of houses on stilts, a solution guided by their floodable daily life. We identified elements of homogeneity in the representation of the transition space between the external context and the house's private space. Evidencing their particularities, the way these spaces are defined by the user is concordant with the relationship they establish with the surroundings— either the ecosystem or the neighborhood. Regarding the gradient, we reinforced the affirmations of Alexander et al. (1969) and Alexander et al. (1977) about Latin American houses demanding privacy control through the configuration of their front as a more formal environment and their back as a more private space. However, the context of each place demonstrated different ways of establishing this, giving rise to a spatial representation that guided the design concept by inserting content from the users' experience into the designers' knowledge (Perdigão and Bruna, 2009).

From this perspective, it is important to understand the traditional Amazonian domestic space based on its use. Its elements enrich the design process, expanding the capacity to configure design proposals related to the spatial experience of Latin American users. Based on studies carried out in Peru (Alexander et al., 1969) and on the analysis carried out in traditional stilt-house communities in the Brazilian Legal Amazon, it is highlighted that in some places in Latin America, people establish different levels of proximity among themselves, which demands transitions between public and private behavior and gradients in the access to the spaces of the house. The way these solutions are expressed differs depending on the context, exposing local particularities relevant to the theoretical and practical fields of architecture. We highlight the international context of the Amazon, at a regional level, as a complexity that evidences the importance of knowing the population that inhabits the region (Aragón, 2018), because Latin American dwellings have traces of native culture and content that cannot be neglected by the hegemonic processes of world architecture production. This attitude favors professional training that accepts the challenge of understanding human peculiarities in the use of the built space and inaugurates a way of thinking about architecture that has the tradition of place as the guiding element of the project process committed to everyday life in the built environment.

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