

## TYPE AND TYPOLOGY OF AMAZON STILT HOUSE IN AFUÁ, BRAZIL Ana Kláudia Perdigão

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### Abstract

The Amazonian stilt of the city of Afuá (PA) is approached as a resistance to the extinction of the riverside cultural tradition. It is proposed a typological analysis by *type* and *typology*, based on topological and geometric aspects, respectively. The joint analysis of the type and typology operatively contributes to the analysis and proposition associated to the experience and the appearance of the spaces, providing a better understanding of the adaptation and well being of the inhabitants of the region. The results show a peculiar way of production and appropriation of space with the manifestation of local values

of the built environment described by the type in the proximity to the river and the forest, in the continuity between private stowage, balcony, house, yard, etc .; and in the *succession* with the presence of spaces of transition between the public stow and the house, as well as described by the typology, confirming the volumetry, the proportions between the parts and the whole, besides the prominence of elements such as gables, access gates and elements of facade. The typological analysis presented approximates intellectual and popular knowledge and provides categories of analysis that allow identifying non - traditional design constraints for the production of environments more compatible with the Amazonian life, strengthening the professional codes of architecture.

**Palavras-chave:** Stilts; Type; Typology; Amazon rainforest; Habitation.

## Introduction

The Amazon's occupation history is marked by submission to a strange, manufactured order, distinct from its natural life order. External and unrelated values also have overlapped regional ones through the local population. An even more critical issue emerges when value overlap occurs through local professionals who oppose the Amazon culture. When architecture, as a knowledge area, assumes that the best comes from the outside, an archaic mindset takes place combined with spatial conflicts, thereby polarizing popular and intellectual knowledge and impeding local knowledge integration.

Recent situations confirm the danger of a manufactured order, as seen in interventions for the Ver-o-Peso Complex revitalization and projects for new occupation of the Eleven Windows Building (Prédio das Onze Janelas), both in Belém's Historical Center area. Both architectural project conception and conversion of use in an architecturally, historically, and artistically important building motivated social mobilization through technical manifestations of state councils and other entities. These cases indicate the level of architectural decisions' resistance against distortions originated from dominant forces that oppose the Amazon culture.

Resistance episodes occurred in certain areas of the city, with organized civilian society acting against public power. At present, however, the same trend does not occur for Amazon habitat production associated with current habitational programs. Amazon culture has been deformed owing to forces acting against tradition and the regionally established lifestyle. This waywardness inspired the composition of the song "Belém Pará Brasil," written in the 1980s by Edmar Idálio da Rocha, singer of the Mosaico de Ravena rock band and architecture student from the Federal University of Pará (UFPA), who lived in the Belém's Historical Center area (Figure 01).

*Good news for hard times* is a call for discussion and architectural reflection on the Amazon habitat, addressing stilt houses as resistance against extinction of the cultural tradition of residing in riverside houses. This context lacks analytic instruments for supporting operational thinking, which may facilitate discussion on spatial representations in topological and geometric architecture genesis, in favor of recognizing local popular vocabulary and to support the way to reclaiming homeland traditions for the professional production of habitats. Stilt houses from Afuá, in Brazil, compose an undeniable manifestation of the riverside culture and respect for the Amazon tradition.

Why focus on stilt houses? What is the point of discussing type and typology? What are the contributions from stilt houses built in Afuá (Marajó Island), Pará, Brazil? These are questions waiting for answers, needed to challenge architectural distortions that are beyond architecture. Statistical data from the Human Development Index (HDI) on the daily life of Amazon communities are not realistic as they classify eight Marajó Island cities as the worst places to live countrywide, using a matrix for public policies evaluation sustained by a Eurocentric, urban, literate, and globalized logic, which does not consider regional geo-historical and sociocultural diversity (Simões, 2015).

### Belém Pará Brasil

They will destroy Ver-o-Peso  
 For building a mall  
 They will demolish the Pinho Mansion  
 For building a condo  
 Poor Old Town  
 Was sold to Hollywood,  
 To be used as a hostel  
 In the newest Spielberg's movie

Come and see if you'd like to  
 But only one at a time  
 We don't want our alligators stumbling on you

It's mentality's fault  
 Created over the region  
 Why so much fear?  
 North doesn't start with an "M"  
 Our natives don't eat nobody  
 It's only burgers now  
 Why doesn't anyone take us seriously?  
 Only our ore

Come and see if you'd like to  
 But only one at a time  
 We don't want our alligators stumbling on you

We drink guarana  
 Whenever we are out of Coke  
 No more homeland stuff  
 Good things come from outside  
 Deformed to the soul  
 Without culture and opinion  
 Northern folks only want to be a part of this nation

Oh! No more evildoing  
 Oh! No more sad rhymes  
 Give our culture back!  
 We want North up there!  
 Why? What's going on?  
 This is Belém!  
 This is Pará!  
 This is Brazil!

**Fig. 01:** Belém Pará Brasil (translated version, originally written in Portuguese) by Edmar Idálio da Rocha, architect and singer of the Mosaico de Ravena band. Source: [https://www.youtube.com/watch?v=8r\\_2NX6aB0k](https://www.youtube.com/watch?v=8r_2NX6aB0k)

In addition to evaluations performed using indicators poorly aligned with the Amazon lifestyle, there are internal dilemmas to be solved. Brazil has an extensive territory and a cultural variety unknown to most Brazilians. Local reality is often little known, even by locals. The aim in addressing the stilt house subject is to widen discussion on a recurrent typology evaluated as a precarious edification from a construction perspective, to oppose a decisive, accepted, and culturally reproduced typology in the Northern flooded ground.

The Amazon context has been remarkably weakened and even antagonized through assumed associations between stilt houses and total precariousness. This is a generalist mindset with distorted implications for habitational policies countrywide. Dissolution of the precariousness concept would support more effective actions, as one criterion is related to sanitation and another to space. In architecture, space is the interest, focus to which knowledge production is directed, to conceive and confirm that local popular knowledge is significantly important in understanding the Amazon habitat. Spontaneous and anonymous architecture compose the city's physiognomy and reveals, through language and expressions, the meaning of the place and environment where vernacular architecture was established (Barda, 2009). This is how the Amazon riverside culture was established with its tracings, roads, houses, and lifestyle, all of which express its habitation style with wisdom.

River-floodplain-forest was the Amazon's traditional occupation pattern until the 1960s, when another pattern was established: road-firm ground-underground (Gonçalves, 2010). The stilt house is a building model that translates the traditional standard and respects water bodies and tide cycles, thus the typical Amazon residence. The Amazon's hydrographic network is a powerful conditioner for territory occupation (Ponte, 2007).

Knowledge contained in the predominantly popular built environment construction, as in stilt house production, offers quick solutions for intuitive connection with the Amazon's environmental conditions. Therefore, it is an organic production, easily adapted by users. However, current architectural practices usually separate conception from spatial living, from user adaptation models, which are not recognized or referenced.

Thus, riverside architecture and its spatiality are important Amazon cultural manifestations and have not been decoded by formal architecture knowledge, although spatiality is a part of the nature of beings. Beings are spatial. Therefore, space is constitutive of the human existence and it belongs to the essence of beings. It is not only functional, rational, or symbolic; it is existential and it simultaneously represents all these factors, once it reflects the needs, expectations, and desires inherent to human existence (Malard, 2006).

Approximation between popular and formal architecture knowledge (Del Rio, 1998; Kuhn, 1970) is a fertile path for invigorating resistance against the extinction of popular knowledge solutions by intellectual knowledge. Architecture is an area capable of reaching integrative knowledge success in Amazon habitats.

Formal knowledge comprises assumptions that define an appropriate and adapted environment, from the end user's perspective. In this sense, understanding and improving the spatial lifestyle by professionally and scientifically producing knowledge on architectural solutions "without architects" (Rudofsky, 1964) that improve a satisfactory spatial lifestyle are important stimuli for invigorating architectural knowledge. The value of vernacular architecture (Oliver, 2006) is undeniable; however, the greatest challenge remains within elaboration of strategies for sharing this knowledge and its consequent incorporation to projects to boost assimilation of popular knowledge by formal architecture. Thus, projects should enable dialogue with spatiality in order to incorporate the space usage into the cognitive and operational processes of architectural conception, as a strategy for knowledge sharing.

Therefore, a typological discussion stimulates an advantageous path to project thinking to be reinvigorated with cognitive and operative advances, with analogical thinking as a conception mechanism (Chupin, 2013); first, in stilt house reproduction where analogy is clearly established; and second, in project methods (Mahfuz, 1984). This is because every architectural project comprises a typological aspect, either in the sense that architects consciously seek to approach or stay away from a determined type<sup>1</sup> or in the sense that all architectural work is definitely intended to be a type (Argan, 2001). Then, type cataloging would be a stimulating mechanism for architectural thinking related to project practices—even if unusual and invisible—different from typology-related visual traditions based on their geometric representations.

The case observed in Afuá, PA, Brazil, is emblematic for analyzing Amazon stilt houses through type and typology criteria. The sense of place is reflected through the manifestation of stilt houses as a strong resistance factor against the extinction of a culture ingrained in the natural environment, which opposes consumerism and the "modernity" appeals brought in association with values from large urban centers and, more recently, from the Internet, which has not influenced local lifestyle. Afuá has been committed to its own lifestyle, which makes it peculiar. Signs are evident along the city (Figure 2). There is a sign saying "do not pass over," which is impossible not

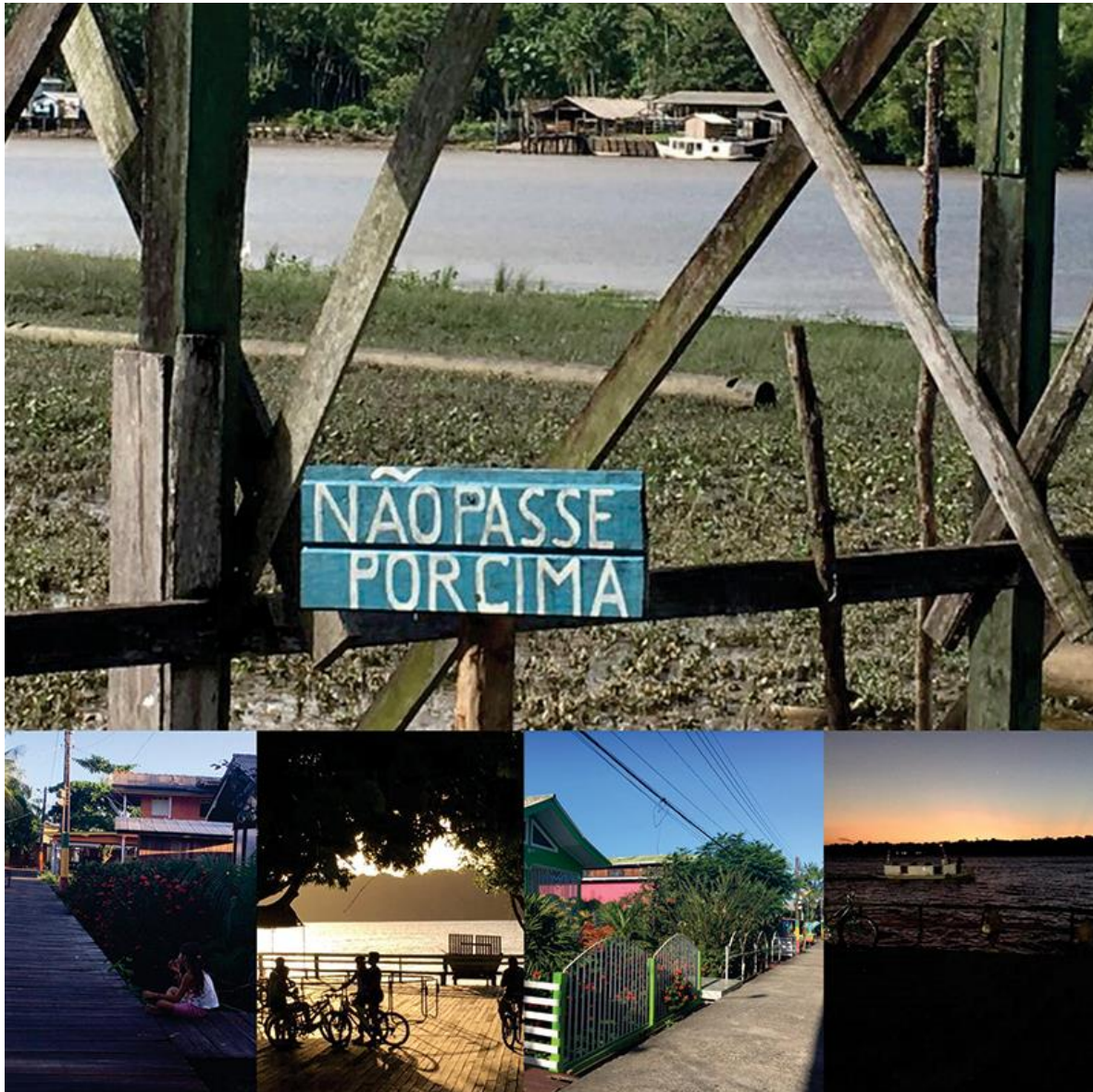


to associate with a warning: “do not pass over our habits and customs; we are proud of them”.

The beautiful Afuá is strongly defended. The cityscape is impressive and manifests itself with stilt house buildings that may differ from the image attributed t<sup>1</sup>o precariousness, slums, and chaos. The suspended city explicitly presents its own order, a remarkable sense of identity, and comforting welfare reflected on the faces of the children, youth, adults, and elderly residents. These points were especially noted in August 2016, when a workshop related to architectural conception was conducted with the local population for the Electoral Forum of the 16th zone in Afuá, where conscious appreciation and satisfaction for history, tradition, and lifestyle was observed, with reference to local spatial and constructive solutions (PASSOS NETO, 2016).

A quick look offers a glimpse of the city’s spirit, the pride of the youth for their location and for the peculiarities that the population enjoys daily, and sensorial and visual experiences emanated by the city, which enrich spatial solutions in topological and geometric terms, between natural and built environments. It provokes a vibrating city experience to be enjoyed.

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**Fig. 02:** Scenes of Afuá, Marajó Island, Pará, Brazil. Photos by Klaudia Perdigão, 2016.

Architectural analysis of stilt house' type and typology is pertinent for improving the thinking for architectural project process. Stilt houses in Afuá, especially supported by spatial experience and with a strong identity of culturally built solutions, symbolize the Amazon riverside life, approved by the rich variety of stilt house spaces as the purest expression of a Northern Brazilian "suspended city."

### **Type and typology**

Analysis of type and typology operatively contribute with analysis and proposition related to spatial life and appearance, complementing each other to shed light on the

regional inhabitants' adaptation and welfare. From a project perspective, type is far from becoming an exhausted topic (Perdigão, 2009). Type constitutes an epistemological foundation by providing an analytic and operative instrument. Type leads hermeneutical and formalization processes as well as presents a double-strand basing that underpins and instrumentalizes both the knowledge-related and creative processes (Tachana, 2011). Therefore, it is important to analyze type in association with typology, which is more traditionally adopted in architectural analysis.

Typological discussions for type and typology refer to the context of spatial representations by defining the start point (Perdigão & Bruna, 2009). Type is inherent to spatial relations and is better described by topological representations, whereas typology or the spatial object model is better described by geometric representations. Geometry reveals the manifested and perceived aspects of objects, including shapes and views through points, lines, and surfaces, whereas topology is less visible. Indeed, topological characteristics resulting from the spatial arrangement of an architectural object, such as a building or an urban situation, are totally invisible (Aguiar, 2007).

Architectural typology is related to the historical dimension and influences project mechanisms. In the academic sense, type and model present a recurrence of approach in architecture (Montaner, 2001). Topological and geometric spatial representation systems are used in association with systematized project methods (Mahfuz, 1984). The typological method uses analogies among types within the topological system, whereas the mimetic method refers to the use of analogies in model/typology within the geometric system.

Operational knowledge on architectural projects through stilt house topological and geometric analyses permit actions targeted to meet various levels, scales, and visualizations of the architectural space, and enables the comprehension of various needs inherent to the human development cycle resulting from interactions with their environment (Piaget & Inhelder, 1948; Muntañola, 2000). From two to seven years old, projective and topological relations are established, but logic operations, such as perception of geometric schemes, may not be performed.

Type based typological analysis proposed herein should be performed through proximity, continuity, and succession relations derived from topological categories based on existential space theory (Norberg-Schulz, 1971). Typology based typological analysis proposed herein should be performed through geometric parameters considering the whole, parts, and significant parts (Argan, 2001).

Type analysis comprises abstractions and elementary organizational schemes, establishing centers or places (proximity), directions and paths (continuity), and areas or regions (succession). These topological relations are captured by human beings and strengthen their sense of orientation as a part of existential space and, as previously mentioned, geometric schemes arise later during the human development cycle (Norberg-Schulz, 1971). The *Amazon stilt house type* related to habitational programs involving families' relocation and resettlement through government actions in Belém, Brazil, was investigated by Menezes (2015).

Architectural typology analysis is herein defined by the concept per Argan (2001), which comprises entire building configurations (whole), building elements (parts), and significant elements (significant parts). Typology is approached through systematized methods per Mahfuz (1984) and in accordance with Argan, by adopting stilt house

model/typology analysis based on the mimetic method. Argan's (2011) concepts are adapted to Mahfuz's (1984) projective thinking, and analyzed categories may also play an operational role within the project process. Physical-spatial elements represent type's varied manifestations.

### Stilt houses Afuá, PA, Brazil: Type and typology

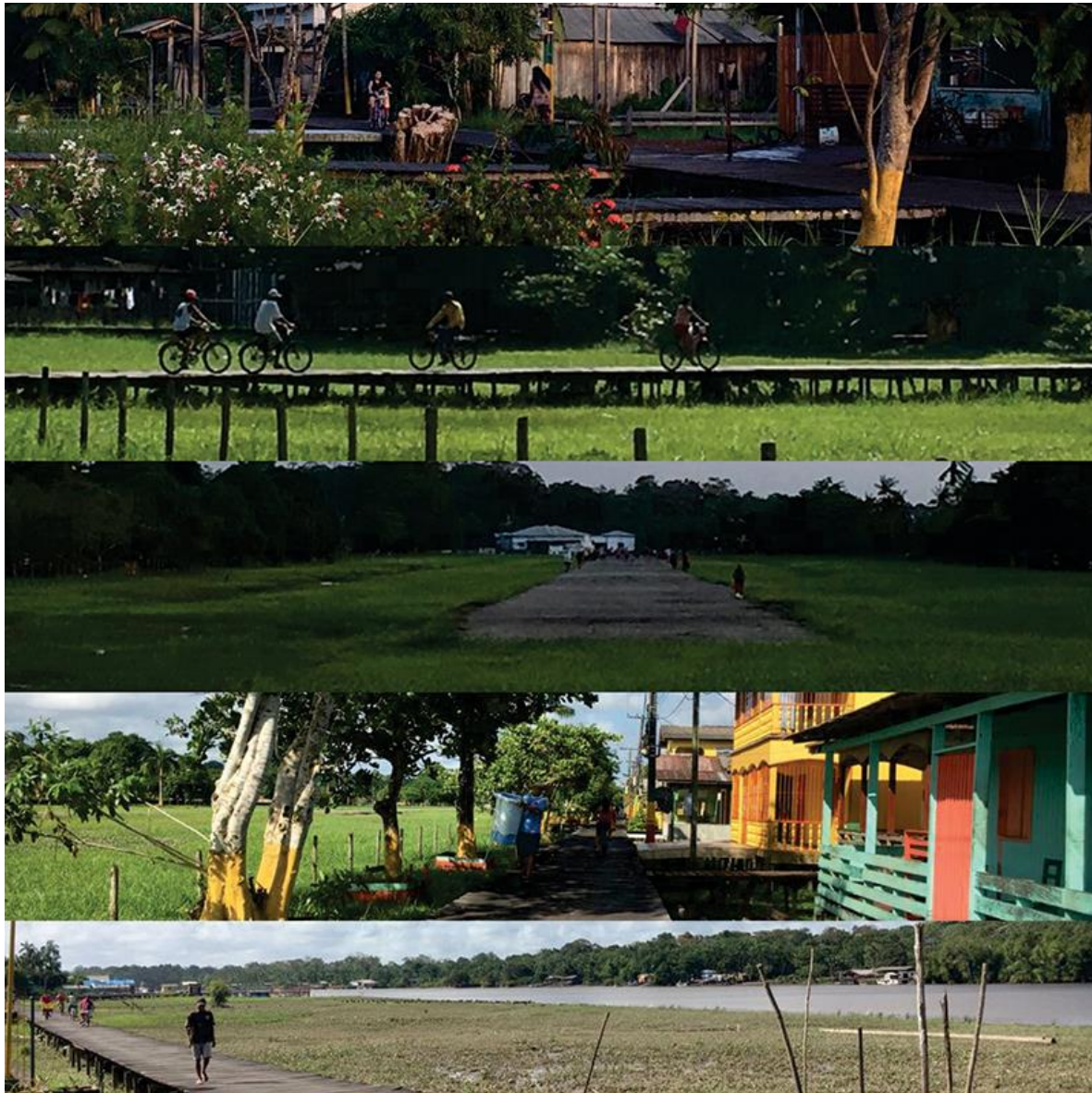
Stilt houses reflect Amazon life in Afuá, which is located in the western portion of the Pará state, in the Northern Marajó Island, Brazil. The city is approximately 254 km far from Belém, PA, Brazil (Figure 3) and its total area is 8,372,795 km<sup>2</sup>, of which 1.7 km<sup>2</sup> corresponds to urban areas. The population is 37,398 inhabitants, of whom 73% live in small riverside villages (IBGE, 2015). Afuá is accessible through a two- to four-hour trip from the Port of Macapá, AP, Brazil, or a 36-hour trip from the Port of Belém, PA, Brazil.



**Fig. 3:** Location of Afuá, PA, Brazil. Source: LEDH Files, 2016.



The cityscape of Afuá presents an organic configuration of harmony between natural conditions and local lifestyle. The city grew spontaneously and irregularly, forming combinations of open and closed urban frameworks with primary and secondary paths that connect the Centro and Capim Marinho districts, which are separated by the Afuá Airport runway (Monteiro, 2015), per Figure 4.



**Fig. 4:** Airport runway separating the Capim Marinho and Centro Districts. Photos by Klaudia Perdigão, 2016.

The main city characteristic is the fact that it does not interrupt the cycle of surrounding rivers. Buildings and public spaces are suspended by up to an average of 2m from the ground level in floodplain areas. Flood control through suspension is crucial, as Afuá is subjected to critical floods every three years, when the city is completely submerged. The city's stilt house design and human circulation using decks

do not permit cars or motorcycles. All passenger and cargo transportation, in addition to urban services, are performed using bicycles, an active and non-motorized method.

Significant respect among citizens to their natural and built environments is observed, as described by Paes Loureiro (1995, p. 235), a poet from the state of Pará, Brazil: "The caboclo observes, analyzes, knows, emphasizes, appreciates, feels, humanizes, and aestheticizes, within his geographic-anthological relation with life. He lives with the landscape in a complementarity relationship". Pinheiro et al. (2012) stated that the regional inhabitants created a special world, where culture prevails as their existence and resistance over time.

Typological analysis concentrates on the demonstration of solutions adopted for Afuá's stilt houses, described by *type* and typology. The proximity relation of the *Amazon stilt house type* with the natural environment is evidenced in less dense areas by their contact with the river and the forest, a typical configuration of Amazon cities such that they are "Forest Cities" (Trindade Junior, 2010).

### **Amazon stilt house type: Topological qualities**

The *Amazon stilt house type* is characterized per the topological qualities developed by Norberg-Schulz (1971), with emphasis on relations of proximity, continuity, and succession for describing relations between buildings, the natural environment, and surroundings, as well as building interior. Relations of *proximity* refer to contact with the natural environment (e.g., river and forest), whereas relations of *continuity* involve the presence of the forest-river-farm-yard system (Loureiro, 2001). Relations of *succession* comprise transitions between buildings and their constructed surroundings.




Description of the *Amazon stilt house type* in Afuá will be analyzed through the relations of the buildings with their surroundings in Centro and Capim Marinho districts. These relations between buildings and natural environment are significantly different in both districts. Centro District presents higher density and less tall-vegetation areas, thus more inclined for construction transformations, especially in the port area surroundings, which significantly differ from the case of Capim Marinho District.

Comparison of the aforementioned differences was performed by selecting two stilt houses for topological quality analysis, located in Centro and Capim Marinho District, shown in Figures 5 and 6.

*Proximity relation* between building and the natural environment presents two aspects. Proximity relation with the river occurs with the free flow of tides, which advance close to the suspended houses in flood periods. The second aspect is the presence of tall vegetation, especially in the district farther from the port area, a denser area subjected to urban life dynamics. *Continuity relation* is maintained from the stilt house access deck until another deck that extends to the back of the house, shaded or not, functioning as a suspended yard. Regarding *succession relation*, it is worth emphasizing that a direct access from the public deck to the house is rare, even in the denser Centro District. Private access decks are short in the Centro District owing to density, whereas private decks are larger in the Capim Marinho District. Majority of the stilt houses presented a transition space between the private deck and main stilt house area, in both the Centro and Capim Marinho Districts.



**Fig. 5:** Stilt house topological analysis, Centro District, Afuá, PA, Brazil. Source: LEDH/PPGAU/UFGA, 2016.

CAPIM MARINHO DISTRICT	
PROXIMITY RELATION	
CONTINUITY RELATION	
SUCCESSION RELATION	

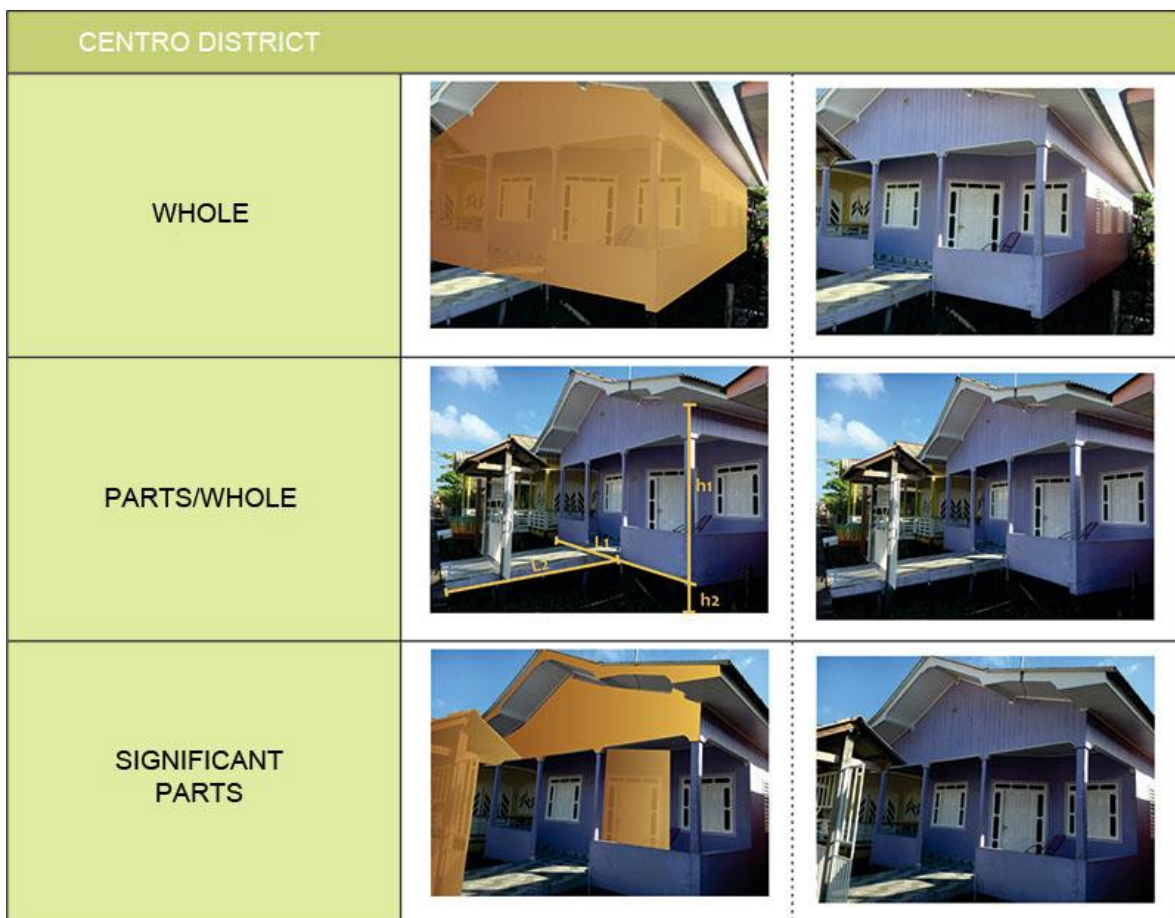
**Fig. 6:** Stilt house topological analysis, Capim Marinho District, Afuá, PA, Brazil. Source: LEDH/PPGAU/UFGA, 2016.

## Amazon stilt house typology: Geometric elements

The same houses previously used for topological analysis will be used for geometric analysis. Such analysis will reflect variations of the *Amazon stilt house type* (Figures 7 and 8). The whole is represented by the building volume; the relation between parts and the whole is reflected by proportions between house height and ground elevation, as well as by the proportion between the height and width of the facade plane. The distance between the public deck and stilt house building through the private deck is also considered as a part related to the whole of the building.

Stilt houses in Centro District have shown appearance modifications, such as the use of masonry slabs and fences; however, stilt houses are still elevated using wooden pillars. Changes have been mainly performed along the main city border and its surroundings. The use of a gate as the frontal limit without the same emphasis for the lateral areas is justified as access control from the main paths. It is worth emphasizing that the replacement of wooden decks with concrete slabs occurs along both main and access decks. This district presents an easy access, from the port area through the main paths, with modifications justified by safety and protection against rodents that are due to people concentration and garbage accumulation in this area.

Stilt house geometric analysis leads to an interpretation in which volume is defined by the consequent rectangular floor plan spatiality associated with the shading volume of an apparent “two-waters” roof. In relations between parts and the whole, proportions between house height and width are not conditioned by the available area for stilt house construction and are similar in both districts; the differences are in the distance between the stilt house and the public road. Among significant parts, details of shading, gables, finishes, and decoration, in addition to benches, balconies, and facade details, are present in wooden houses as an extensive solution repertory; these elements prevail even in masonry houses in the Centro District and have been repeatedly used in stilt houses of the Capim Marinho District. Thus, these elements provide a strong identity to local buildings. Significant elements are widely reproduced in wooden houses, even in the non-colorful painted stilt houses of the Centro District. There is a rich variety among the stilt houses of Afuá.



**Fig. 7:** Stilt house geometric analysis, Centro District, Afuá, PA, Brazil. Source: LEDH/PPGAU/UFGA, 2016.



**Fig. 8:** Stilt house geometric analysis, Centro District, Afuá, PA, Brazil. Source: LEDH/PPGAU/UFGA, 2016.

## Final considerations

*Good news for hard times* stimulates and encourages studies and reflections on how architectural thinking and practices may interact with manifestations of the socially produced Amazon habitat. Within this context, type and typology approaches for Amazon stilt houses reveal an opposition to hostility against Amazon culture through urban life consumerism, public power decisions, professional prejudice, and other factors arising from low societal appreciation for what comes from the popular knowledge.

Afuá is a living example of the appreciation for Amazon riverside culture, an invaluable source for investigating new connections between formal and popular knowledge. The Amazon habitation experience comprises intuitive knowledge and a deep sense of belonging, which is worth including in formal architectural knowledge.

Typological analysis of stilt houses built in Afuá explicitly leads to reflections on the importance and need for including popular knowledge in formal architectural knowledge. The polarity between *type* and *typology*, herein addressed in the stilt house analysis, composes local life's repertory and references for a more Amazon-

aligned architectural production. The attempt is to engender reflections and a combined analysis of type and typology, which will support the genesis of architectural projects that are committed with sense of reality and incorporation of local references.

*Amazon stilt house* type topological relations are reproduced in other districts that are closer to the port and compose the main access to Afuá, PA, Brazil. However, the higher density observed in the Centro District results in less abundant vegetation compared with the Capim Marinho District. Variations of significant parts' geometric elements are more visible in the stilt houses in the Centro District, especially those in balconies and private life limits (access gate), in addition to the smaller private deck size, when compared with those from the Capim Marinho District. Direct access between the stilt house and the public deck was rarely observed; access is done through a private deck. Models were varied and consistent with the *Amazon stilt house* type principles, considering volume, dimensions, and featured elements.

The complexity of the social demand for domestic space defies many scientific knowledge areas that have sought answers to problems that keep changing and are not solved, including anthropology, history, human geography, engineering, social work, architecture, and urbanism. From a project perspective, habitational space comprises various questions to be investigated by architecture, such as urban and building scales. The building scale requires scientific research to test spatial usage evidence to support architectural practices.

Even in Afuá, with its riverside lifestyle tradition, stilt houses are built with richer and purer details in areas farther from the center, which are reserved for city inhabitants, such as the Capim Marinho District. Local construction traditions are maintained for new buildings, showing respect and pride for the spontaneous city and its references. Stilt houses present a rich variety of relations and elements, which produce a charming identity, even for those unfinished structures and with provisional appearance. In the words of da Rocha, *come and see if you'd like to*.

## Note

<sup>1</sup>Quatremère de Quincy accurately described "type" in architecture in his *Historic Dictionary*: "The word 'type' presents less the image of a thing to copy or imitate completely than the idea of an element which ought itself to serve as a rule for the model (...) When a 'type' is fixed in architectural practices or theory, it already exists within a determined cultural historic condition as an answer to a group of ideologic, religious, or practical requirements" (Argan, 2001).

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