

**Sustainability and the culture of the place: the riverine habitat in
Amazonia**

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ABSTRACT

In this paper, it is investigated the concepts of sustainability by the importance of the culture of the place in the production of architecture. As of a case of study in a riverine housing in the Amazon, it is analyzed the environment built and the speech of the dweller as for healthy life and respect to the place to relate its limits of integration between technical and formal knowledge of sustainability to traditional knowledge in the Amazon habitat. The case of study has an empirical and qualitative character and investigates the present phenomenon into its context of reality with the use of multi-methods. It is highlighted the importance to evidence the theme of sustainability for, in many times, it is not taken into account the proper frames and deepening of cultural and environmental peculiarities. It is aimed to relate the limits of integration between technical and formal knowledge of sustainability with the traditional knowledge in the Amazon habitat based on the analysis of the environment built, crossing it with the speech of users, exploring, this way, some cultural and environmental peculiarities. Thus, the results present formal concepts of architecture in order to understand the profound relation between the environment built and the riverine inhabitant's way of life. It makes sense to recognize the proper uses still present in the dynamics of life in the Amazon, as a consolidation of citizenship, associated to a search for life quality for, then, thinking about the so called sustainability from the most varied and complex dimensions of the Amazon habitat, which are rather still invisible.

KEY-WORDS: Sustainability. Culture of the place. Riverine habitat, Amazon

INTRODUCTION

Sustainability in architecture and the culture of the place is shown as very much compromised to the riverine way to inhabit the Amazon. Hence, the search for a deep knowledge about the real necessities of the communities of the region is justified by the blank of knowledge already existent, as formal values developed to a specific reality as a hegemonic theory may be overlaid to the traditional values of the area.

It is highlighted the importance to approach the sustainability theme in the Amazon as it is a widely discussed subject in the professional area, with a hegemonic approach. It is not taken into account the proper frames and deepening of the environmental and cultural peculiarities for places that are quite different from the origins of such reflections and academic and professional postures as well. This subject presents a great relevance for it works with techniques that do not always match with local reality (PERDIGÃO, 2016).

Riverine housings may be considered examples of vernacular architecture for they are edified by their own residents and there is not, in the local context, the social division of the architect's work and the constructor's one. Then, the housings present a rudimentary looking when compared to other more developed types, but they are able to satisfy the necessities of the context they are in. Such condition does not downgrade such architecture, as the empirical knowledge is not in any way inferior to the theoretical one (SILVA, 1994).

In view of the studies of Norberg-Schulz (1976), there is a multiplicity of places that differ due to their activities. Thus, according to the circumstances, each place presents a proper identity, but this essence of the place must be noticed by the architects from inter-human relationships that occur according to each culture. Also, the identification with the place is one of the fundamental necessities of man, who needs to experiment "meanings" in his own environment;

Thus, this study of case, with an empirical and qualitative character, investigates the present phenomenon of sustainability inside a context of reality, using, for so, multi-methods. Then, it was necessary to analyze the environment built and the speech of a dweller as for healthy life and respect to the place, so that it was able to relate the limits of integration between technical and formal knowledge of sustainability to traditional knowledge in the Amazon habitat.

The integrated project, which is a method used by sustainable architecture, in terms of social impact, may strike in a positive or negative way the communities they are assigned to. So, the history of the site and its ethnography must be examined in order to determine the ideal conditions to improve life quality of pre-existent communities (KEELER; BURKE, 2010). Thus, it makes sense to recognize and project forms and content that shall retreat a face of the regional reality, which expresses ways of life that are spatially registered in these places (JÚNIOR, 2002).

Another technique used by sustainable architecture is permaculture, which deals with the observation of natural systems, the wisdom contained in traditional productive systems and the modern scientific and technological knowledge as well. Therefore, it deals with the edifications, the infrastructure (water, energy, communications), plants and animals, but not in an isolated focus, for it focuses, primarily, on the relations that may be created amongst them, always with the objective to create systems that are ecologically correct and economically viable, being able to support their own necessities without exploiting or polluting and being sustainable at a long term (MOLLISON; SLAY, 1994).

Observation and research are abilities of the designer that must be used to identify the resources and limitations of a site, such as winds, rain, flooding, etc, as it is important the contact with local dwellers in order to acquire more information about nature, problems in the region and the most used techniques to obtain a wider view over the area (MOLLISON; SLAY, 1994). The association between formal and local knowledge in the production of the environment built evidences the importance of studies that may promote the dialogue between these knowledge and the other for the production of knowledge turned to the improvement of the design, being important to the identification and systematic observation of the places, which are their structural Power and the generating factors of spatial qualities (PERDIGÃO, 2016).

Thus, to this case of study, it was necessary to analyze the environment built and the speech of the dweller as for healthy life and respect to the place, so that it was able to relate the limits for the integration between technical and formal knowledge of sustainability and the traditional knowledge in the Amazon habitat.

It was aimed to discuss the concepts of sustainability integrating knowledge between the environment built and the users to a greater comprehension of the culture of the place in the production of the environment built in the Amazon, as the riverine housing is a strong cultural register manifested in the environment built and in the daily life of the dwellers, where they establish a close and healthy relationship with nature.

Then, from the understanding of the importance of the culture of the place in the production of architecture, there is a practical way to analyze these concepts in a riverine

housing in the Amazon, a place where there is a strong cultural aspect, manifested in their habitat and a very close relationship with nature.

METHODOLOGY

The object of study is a research of design that uses scientific methodology to obtain new knowledge about sustainability from spatial life inside the social and riverine reality of the Amazon. It is a study of the qualitative nature that involves a approach of its object, studying it in its natural configuration (MINAYO, 2009).

Thus, it was performed a study of case in a housing called Usina Vitória, located in Das Onças Island , in the municipality of Barcarena, Pará. The island is inserted in the Guajará Bay, in a way that it is surrounded by fresh water. Its territorial extension is 75 thousand hectares and is around 10.7 km away from the city of Barcarena and only 4 km away from the city of Belém, capital of the State.

The housing presents a harmonious relationship with the place, reflecting the dwellers' way of life, a couple and their two children. Besides, they receive actions of researchers in their house for the best use of natural resources through installed sustainable techniques and systems, as well as improving the way of life in the forest by the craft and zeal to the housing and its surroundings.

Figure 1: Housing façade



Source: LEDH Collection, 2020

Figure 2: Housing façade



Source: LEDH Collection, 2020

Since the beginning of this work, it was established a contact with the dwellers through visits performed by the Space and Human Development (Espaço e Desenvolvimento Humano (LEDH)) Laboratory and team, linked to the Programa de Pós-Graduação em Arquitetura e Urbanismo da (UFPA) Universidade Federal do Pará (Urbanism and Architecture Post-Graduation Program of the Federal University of Pará), once the riverine housings in forest and urban areas are subject to institutional investigation.

The techniques used in the research worked for the presentation of riverine housings for focusing on sustainability through the phenomenon of the place, according to Norberg-Schulz (1976). They were defined from the objectives and, therefore, it was used multi-methods, i.e., it was performed a participant observation, the physical-spatial collection of data and its re-design, besides interviews with dwellers.

Then, in a first moment, it was performed a collection of bibliographic data about the sustainable architecture concepts and Theory of Project and, right after, it was presented the results obtained with the study of the housing case, multi-methods, data collection as for the physical aspects of the housing under study. It was completed the speech of dwellers about their culture and relationship with the place, considering the production of the housing and the forest that surrounds it.

As a way to amplify the look over sustainability in architecture, so that it is possible to reach the specificities of the riverine habitat, it is necessary to understand this culture from the individuals under study and the tool that has been used to such activity was Phenomenology, which has the aim to seek an understanding of the complex world of experiences lived by the point of view of those users (GROAT; WANG, 2013), considering, mainly, what is in the mind of the individual, his opinions, his attitudes and beliefs. It comes from the daily routine, the understanding of those persons' way of life. Thus, it was aimed to identify the meanings attributed by those individuals to the object of study (GIL, 2014).

Norberg-Schulz have also used phenomenology of architecture in their theories. Since the 1960's, their books have evidenced a growing interest for the theme, identifying in architecture the phenomenological potential, as the capability to give significance to the environment through the creation of specific places with a method designed as "return to things", in opposition to abstractions and mental constructions (NORBERG-SCHULZ, 1976).

4. RESULTS

For Broadbent (1976), some characteristics of mind and body are established by heritage, including body structure in certain complex internal processes. When building up, it is necessary to take into account the way the user notices space to satisfy his necessities, otherwise, the building may become something disturbing for him.

However, the traditional path of environmental investigation has been concerned about fragmenting the studies. Then, it was established environmental Standards that are not based on systemic interactions of the human senses with the built surroundings, as there are evident and clear discrepancies between the recommendations based on experiments and the situations of real life. Some researches based on pre-established standards may be considered undetermined. When isolating a variable of the surroundings, it is distorted, inevitably, the effects of the relations amongst the several sensorial modes, as, in reality, the human body does not ignore the evidence of any one of his senses (BROADBENT, 1976).

In this context, for Norberg-Schulz (1976), the Word "inhabit" may design a relationship between human and place: when he inhabits the place, he is placed in space and

exposed to a specific environmental character. Through these concepts it is possible to understand the importance of two psychological functions: “orientation” and “identification”.

In order to conquer an existential supporting base, the man must be able to guide himself, to know where he is. But he is also supposed to identify himself to the environment, that is, he needs to know *how* he is in a specific place (NORBERG-SCHULZ, 1976, p. 126).

Hence, the results of this paper present the deep relationship that exists between the environment built and the riverine way of life, using, as a base, the concepts of identification and orientation presented by Norberg-Schulz (1976).

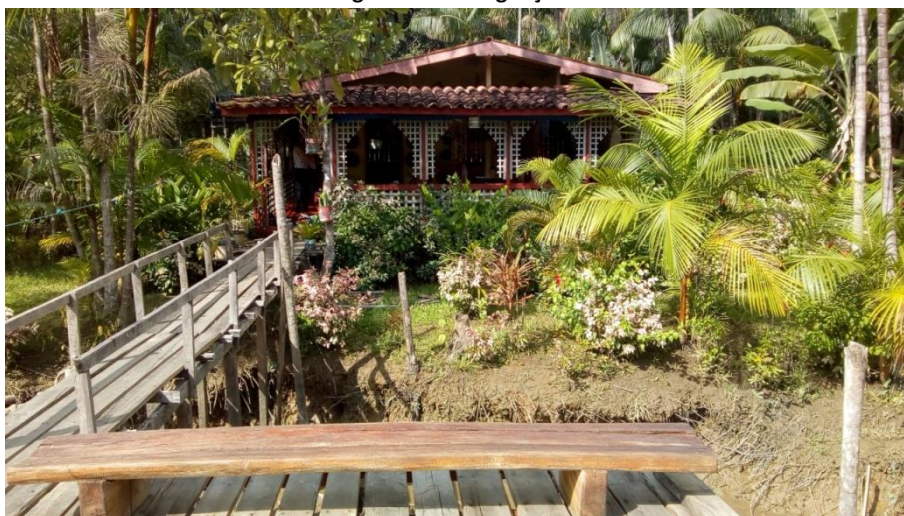
4.1 IDENTIFICATION TO THE SPACE CONSTRUCTED

The objects of identification are concrete parts of the environment and it may be said that, generally, these relationships develop during the human’s childhood. The child starts to know the space around and begins to form perceptual schemes, These systems of schemes are shaped by inter-human, cultural and place relationships. Thus, identification means to have a friendly relationship with a specific place, as the environment lived bears many meanings. (NORBERG-SCHULZ, 1976).

The object of study here is considered, by architecture, a house of a stilt type, due to its geometry and space. Stilts reflect quite well the way of living in the Amazon, in the middle of the rainforest (PERDIGÃO, 2016). The dweller interviewed identifies himself to this typology since early childhood and, as he has abilities with carpentry, he has chosen to build his house with this form, as well.

In order to better understand the space built, he was asked as for what makes him feel identified with the place and presented several reasons, as the implantation of the house in that area, the relationship with the materials used, the use of the house and the distribution of space.

Figure 3: Housing façade



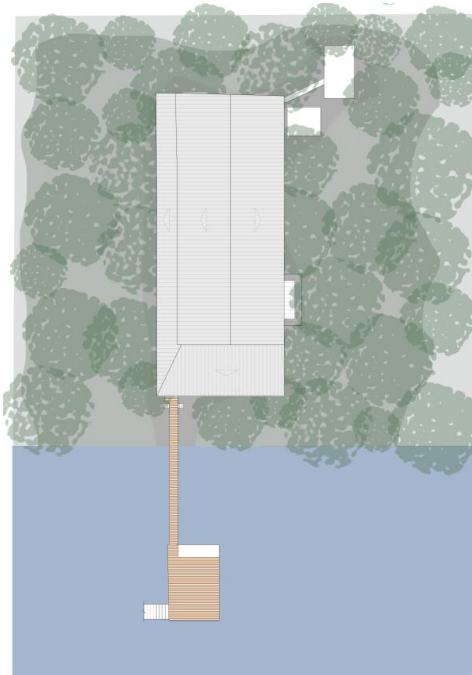
Source: LEDH Collection, 2020

The dweller and wife have chosen to live in the island for they identify themselves with the riverine way of life, a both of them have grown up in houses at the margins of the river and have learned abilities to live together with nature in a harmonious way: sailing, walking through the jungle, planting, harvesting, amongst many others.

Besides, local knowledge also works well to the dweller at the time they have to choose the best place to implant the house, as it needs to be close to the river due to the strong bond with it, but with the right distance in order to avoid the period of high tides, so the water could flood the house. As he said: “Nature presents many surprises and there is no way to fight it or interfering”.

To Júnior (2002), in the context of riverine housings, it is important to understand the interactions and ways of life that have been established between the people and the river, being it a means of transportation, source of economical and subsistence resources, or also as a symbolic reference to the people who live there. Thus, it is important to understand these concepts, for there is a great material and symbolic dependence on it.

Figure 4: Implantation



Source: LEDH Collection, 2020

Besides, as it may be seen, the house is surrounded by the jungle and there are also knowledge and peculiarities about the cultivation of different species and its location. The interviewed dweller stated to have learned to deal with the land during childhood, when observing his grandmother and uncle at work. Then, he chose to plant fruit trees close to his house, besides a little vegetable garden. In the rest of his land he has kept the native forest in which he just interferes to make the handling of açaí and to extract wood, if necessary.

Carpentry was one of the abilities learned by the dweller. So he felt quite confident to build his own house with wood. According to him, it would be easy to make maintenance in the house as he knew the material and it was available in the region. Also, to the riverine man, the use of wood keeps the house fresh and aired, ideal to the local climate. The roof was made with clay tiles, referred by the dweller as the most proper ones for comfort.

Figure 4: Balcony



Source: LEDH Collection, 2020

Figure 5: External kitchen



Source: LEDH Collection, 2020

As for the distribution of housings, it was done by the dweller, using his own understanding of the houses he had been living before, through their different flows and uses. Thus, social space is in front of the house, closer to the river (main access). And the service part is at the back of the house in a private place as well as the intimate rooms (bedrooms and bathrooms) that are in a more private place.

About the use of environments, the dweller stated the most used ones are the porch and the kitchen areas, for the inhabitants of the house enjoy to put their hammocks to rest and to receive visitors on his porch. The kitchen is usually very crowded because there is where the meals are prepared, besides the food is offered to visitors that are seeking to know foods of the region and the life in the forest.

Besides the ancestors knowledge that takes the owner to keep a way of life with his family, there is also a group of professional interventions that potentialize his personal and familiar values with which, he understands, will grant him positive gains to maintain his “healthy life style” inside nature and keep his cultural values alive. Frequently, the riverine people receive visits from friends, tourists and researchers (national and international), who are quite welcome for they are people who are looking for a better understanding of the habitat in the forest, and, thus, as the dweller himself says, there is an interesting interchange of knowledge.

Within so many invitations and interest, the dweller accepted to participate in a Project offered by Federal Amazon Rural University (Universidade Federal Rural da Amazônia

(UFRA)) for a research of a system to use rain water for domestic activities, including drinking water. When questioned about why accepting such innovation in his house, he stated that it was going to improve his quality of life, as he did not have any easy access to drinking water. And he also added that his ancestors had already taught him that rain water was good for human consumption and it was quite common to collect rain water from roof pipelines and later strain and boil it.

The second project proposed by the same researchers was the ecological bathroom that does not use any water for flushing and the waste are accumulated in a “carboy” with dry sawdust, for being later transformed into organic composting, that the owner says to be used in his fruit trees plantations. He also added that his interest by the system has grown due to the lowering of contamination of the river waters by the common bathroom in the house.

Figure 6: Water tank



Source: LEDH Collection, 2020

Figure 7: Ecologic bathroom



Source: LEDH Collection, 2020

In the project proposal, the bathrooms should be constructed in the external areas of the house in order to avoid any disturbance related to bad smell or the presence of insects. However, the dweller has decided, on his own, to perform an alteration of the proposal of the researchers and has built the bathrooms with Access through the dormitories, inside the housing, for he understood that it would be more comfortable for the family. The first ecological bathroom in his house was built by the project and he second one by his own, as he had already acquired the knowhow so he could copy the system. Therefore, he has executed a good maintenance for the system to work well, reporting no discomfort with the solution adopted.

4.2 DWELLING: GUIDANCE AND SAFETY

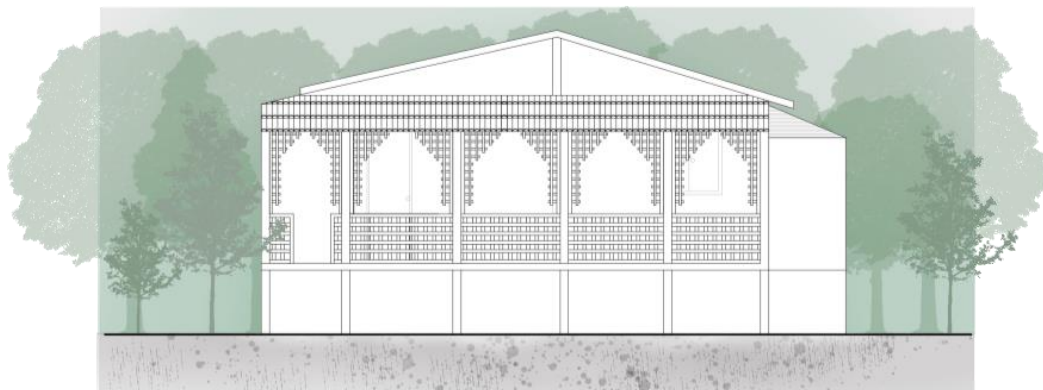
When the guidance system is fragile, the person shows difficulty to guide himself and feels lost and the fear to get lost is part of the necessity of living beings to guide around. Feeling lost is exactly the opposite of the feeling of safety that defines dwelling, as well as the identification with the place is defined (NORBERG-SCHULZ, 1976). The contact with dwellers of a riverine housing, as the one that has been studied, permits to verify that such concepts assume a protagonism in routine life, demonstrating a well being, what is curiously incoherent with the precariousness of the environment built inside the frame of urban life.

The owner, who knows either the jungle and the river that bathes the island, presents a sense of guidance and moves quite well around in his own boat, as it is the main means of transportation in the place, going to other cities looking for foods, services or revenue or moving around local places.

The dweller says he feels safe in his home, a sensation he did not feel when he lived in the city of Belém, Pará. It is not observed any kind of visible division around the house, nor in the neighbor houses, only a trail open in the jungle for identification. The riverine man stated that it is common for people in the neighborhood to circulate through his area to have access to other parts of the island.

The knowledge of the owner of the region has overall interfered in the choice of the house location, for it was built elevated from the soil with a height of 1 meter, aiming to protect the domestic ambient during the period of high tides, as many persons lose their houses during this period for they do not know the region very well and build their houses in lower levels.. Also, it is part of the local knowledge the choice of the right wood for the construction of housings, what permits a longer span of the space edified.

Figure 8: House view



Source: LEDH Collection, 2020

In the Amazon region, the climate is equatorial humid, with constant rains and high temperature, normally varying between 22°C and 28 °C, commonly found in areas near the equator line. The analyzed housing is located in Das Onças Island, in the jungle of floodplain, where there is flooding from the river waters in some periods of the year. In the most elevated

part of this jungle, the flooding time is short and the vegetation is quite similar to the ones in the dry land (LINHARES; GEWANDSZNAJDER, 2016).

Thus, knowing nature very well allows the dweller to promote the support to his family without the need to cause any damage to nature with the handling of açaí for trading or fishing several types of fish and shrimp, as well as collecting fruits in the backyard for self consumption. It is fair to highlight his comment about wood trading, regretting for removing a great quantity of wood, even as, previously, the area had already been exploited in a way not quite healthy for nature.

CONCLUSION

The results obtained in the analysis of the riverine housing, when discussed based on bibliographic research about sustainable projects, have shown the importance of an approximation between technical knowledge and the local community to align the interpretation about the local reality, what is quite more noticeable for the fact that the riverine housing is a strong cultural register manifested in the environment built and in the routine of dwellers where they establish a close and healthy relationship with nature.

The traditional path of environmental investigation has been concerned to fragment sustainability studies amongst public policies, nature, cities and constructions. Thus, environmental aspects and standards are elected, which are not based on systemic interactions of the human senses with the built surrounds. The analysis of the riverine housing, when well followed by the universe of dwellers, reflects a peculiar way of life from what it is strengthened the importance of recommendations that may feed the formal knowledge of architecture.

Noteworthy, studies of cases bring important results and demonstrate evident and clear discrepancies between recommendations based on technical knowledge and situations of real life. Some researches based on pre-established standards may be considered undetermined or unreal, as the condition for well-being and the consequent quality of life may be recognized outside of the hegemonic theories of architecture, once inside them it is not contained the peculiarities that characterize the culture of the place and the peculiar life of their inhabitants, that is, the environmental quality, here understood as the essence of the place (NORBERG-SCHULZ, 1976).

Thus, the results obtained with this study of case permit to understand several meanings attributed to the inhabited space by the dweller-owner. It is also understood in what way and with which elements the dweller identifies and guides himself to in the place where he lives. Therefore, it may be presumed that it is important that these two functions are fully developed for a complete feeling of “being” in the place. A local knowledge that would lead to a provocation about the universality of architecture, that would bring important questions to the base of knowledge of project and that, as a rule, are discharged by the graduation of the architect, but that offer great contributions to the elaboration of projects that are more compromised to the culture of the place.

The Amazon region has remarkable references of a life totally in harmony with the environment and with the local culture, what turns the scientific work quite careful until it recovers, by the formal knowledge, the very peculiar traces and values of being and producing the environment built, a protagonism that is between formal and local knowledge.

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