

Reframing Amazonian Urbanism Architectural Hegemony and Vernacular Floodplain Landscapes

SESSÃO TEMÁTICA: DIMENSÃO HUMANA DO PROJETO, DO PLANEJAMENTO E DA GESTÃO DA PAISAGEM

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RESUMO

Em diversas cidades amazônicas, as comunidades ribeirinhas vernáculas demonstram integração ecológica e adaptabilidade social diante da rápida urbanização e da variabilidade climática. No entanto, o planejamento urbano e os paradigmas arquitetônicos convencionais frequentemente privilegiam formas coloniais ou importadas, marginalizando as comunidades vernáculas e seus sistemas de conhecimento. Este artigo tem como objetivo avaliar as tipologias de infraestrutura urbana na Amazônia e desenvolver uma estrutura holística para sua valoração, facilitada pela introdução do conceito de hegemonia arquitetônica—o domínio cultural e institucional de certas normas arquitetônicas. Com base em análises históricas, político-ecológicas e linguísticas, e utilizando dados de Iquitos, no Peru, este trabalho demonstra como a arquitetura vernacular pode contribuir para os serviços ecossistêmicos, a coesão social e a resiliência urbana. Apresenta-se uma estrutura comparativa para as tipologias de infraestrutura, oferecendo um método holístico para avaliar os impactos complexos da urbanização na saúde humana e ecológica. De ampla aplicabilidade às cidades amazônicas, as descobertas promovem um projeto urbano sustentável, adaptado ao clima e socialmente equitativo.

PALAVRAS-CHAVE: Amazônia, vernácula; hegemonia; comunidade ribeirinha; adaptação climática

ABSTRACT

Across Amazonian cities, vernacular floodplain communities demonstrate ecological integration and social adaptability in the face of rapid urbanization and climate variability. Yet, conventional urban planning and architectural paradigms often privilege colonial or imported forms, marginalizing vernacular communities and their knowledge systems. This paper aims to assess urban Amazonian infrastructure typologies and develop a holistic framework for their valuation, facilitated by introduction of the concept of architectural hegemony—the cultural and institutional dominance of certain architectural norms. Drawing on historical, political-ecological, and linguistic analysis, and leveraging data from Iquitos, Peru, this work demonstrates how vernacularity can contribute to ecosystem services, social cohesion, and urban resilience. A comparative framework for infrastructure typologies is presented, offering a holistic method for assessing the nuanced human and ecological health impacts of urbanization. Broadly applicable to Amazonian cities, findings promote sustainable, climate-adapted, and socially equitable city design.

KEYWORDS: Amazonia; vernacular, hegemony; floodplain community; climate change

1. INTRODUCTION

Amazonian landscapes are defined by seasonal hydrology, rich biodiversity, and centuries of human settlement. Since time immemorial, Amazonian communities have inhabited vernacular housing typologies adapted to floodplain dynamics, including seasonally floating and stilted homes. Floodplain communities reflect Indigenous ecological knowledge, using renewable and locally sourced materials and maintaining cultural continuity while providing resilient housing and climate change solutions.

Despite these benefits, policy privileges colonial or otherwise imported urban design styles that are relatively ill-adapted to Amazonian hydrology. These impermeable highlands typologies—where pavement and concrete dominate—inherently engineer the sponginess out of landscapes, contributing to layered urban health challenges including flooding, the urban heat island effect, biodiverse habitat loss, and climate change exacerbation.

Floodplain typologies, on the other hand, have the potential to mitigate these challenges through provisioning of ecosystem services that support urban health, environmental health, and climate change mitigation. However, despite some vernacular floodplain communities pre-dating formal highlands settlements in some of the Amazon’s largest cities (ABITA PERÚ, 2011; BARTRA, 2014; FALDETTA; REIGHARD; DICKINSON; WANG *et al.*, 2014), government agencies are yet to include vernacular floodplain architecture in formal urban systems. Legal recognition, aesthetic value, and economic investment reinforce the dominance of imported typologies, marginalizing vernacular knowledge and perpetuating inequities in housing, health, and ecosystem stewardship.

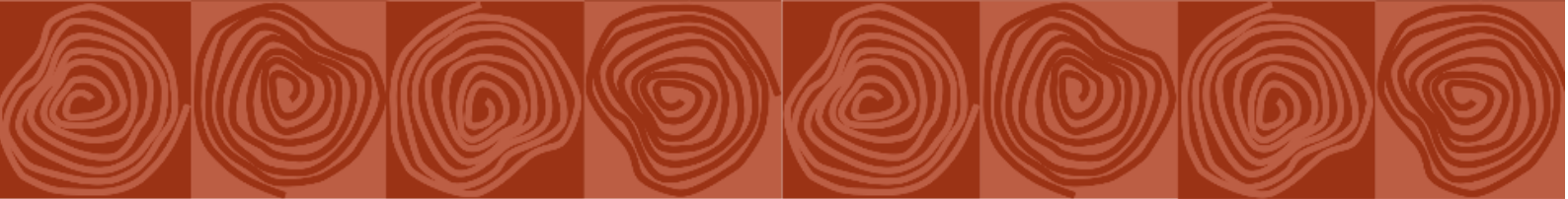
This paper introduces *architectural hegemony* as a conceptual lens to understand these dynamics. Architectural hegemony describes the dominance of specific architectural norms that define legitimacy, safety, and aesthetic value, while undervaluing vernacular and pre-colonial approaches. Using data from Iquitos and comparative examples across the Amazon, this study explores how vernacular communities contribute ecological, social, and economic benefits to Amazonian cities and proposes a comparative framework for valuing urban Amazonian landscape typologies to inform sustainable urban development.

Figure 1: Seasonally floating vernacular floodplain homes in Iquitos, Peru



Figure 2 Source: Traction Design

1.1 The urban Amazon



The Amazon Basin—home to more than 48 million people in parts of Bolivia, Brazil, Colombia, Ecuador, Guyana, French Guyana, Peru, Surinam, and Venezuela—has seen rapid urbanization over the last century. Urban populations increased from roughly 30 percent in 1960 to 60 percent in 2009, reaching over 70 percent—approximately 33.6 million people—in some regions today (URIBE; LANFRANCO; MARTÍN, 2023). Urban migration in the Amazon is driven in part by the relative absence of healthcare, education, and economic opportunity in rural areas. In the largest urban centers, including Manaus (over 2.2 million), Belém (nearly 1.4 million) (IBGE, 2023), and Iquitos (approximately 500,000) (INEI, 2020), this migration increasingly outpaces the planned expansion of health-supporting services such as housing, sanitation, and healthcare. An estimated 20 to 33 percent of urban Amazonian residents—roughly 6.7 to 11.2 million people—are unable to compete in formal housing markets and instead live in self-managed communities, many on urban floodplains (INEI, 2020).

These characteristics are not unique to the Amazon basin, but echo built environmental manifestations of urbanization and unequitable policy in cities around the world (POTTS, 2020). An estimated 24 percent of planet Earth’s urban population—nearly one in four people and over one billion in total—resides in informal and/or substandard housing (UNITED NATIONS, 2021). In Latin America—consistently the most rapidly urbanizing region in the world with approximately 81.2 percent of people living in urban areas in 2018 and a projected increase to 89 percent by 2050 (UN HABITAT, 2023)—that proportion is slightly lower, with a reported 20.9 percent of people living in such communities (UNITED NATIONS, 2021). Amazonian cities are aligned with the Latin American average. These statistics demonstrate a growing proportion of informality over the course of urbanization—trends that will not slow without equitable systematic intervention.

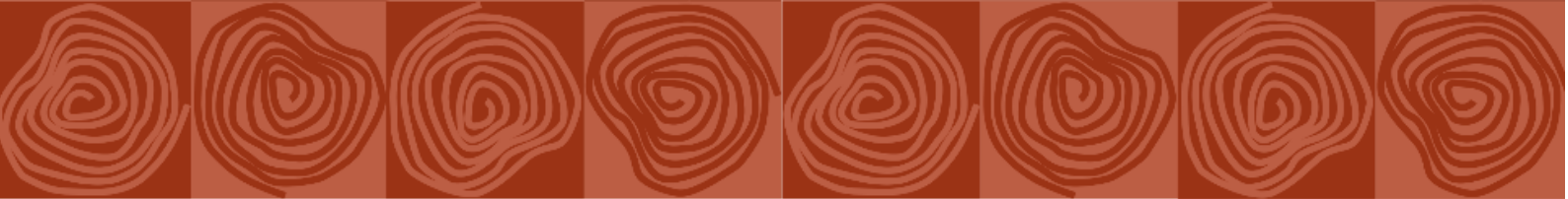
2. THEORETICAL BASIS

Urban Amazonian landscapes emerge from intertwined social, ecological, and architectural processes. Analysis of these interactions necessitates a layered conceptual foundation that accounts for historical legacies, material practices, and social hierarchies. This section defines key concepts necessary to evaluate housing contributions across social and environmental domains. By integrating historical, political-ecological, and linguistic perspectives, this section highlights the multidimensional nature of housing, formality, and vernacularity in the Amazon, situating these within the broader discourse of built environment design and policy.

2.1 Architectural Hegemony in the Amazon

Urban Amazonian landscapes are shaped by historical, ecological, and social processes. Vernacular communities—self-built settlements adapted to seasonal flood cycles—represent living architectural traditions rooted in Indigenous knowledge, local materials, and intimate familiarity with riverine ecosystems. Despite these adaptive qualities, such communities often occupy informal or unrecognized legal status, limiting access to infrastructure, services, and formal investment. This structural marginalization reinforces a dominant architectural paradigm, or architectural hegemony, in which conventional, formalized housing is equated with safety, legitimacy, and aesthetic value, while vernacular and pre-colonial approaches are undervalued or dismissed.

Hegemony, as defined by Gramsci and later applied in architectural and urban studies, refers to the ways in which dominant power structures and cultural norms shape perceptions of legitimacy and authority (HOARE, 2005). Applied to Amazonian urban contexts, architectural



hegemony manifests in policy and planning frameworks that favor conventional construction, often imported or externally prescribed, while ignoring the adaptive, low-impact, culturally meaningful qualities of vernacular settlements.

2.2 Historical and Political-Ecological Context

Contemporary pressures in urban Amazonia are rooted in deep historical processes that restructured land, labor, and community life across the Amazon. Understanding these dynamics benefits from application of political ecology, an anthropological approach that critiques dominant environmental narratives by focusing on how power dynamics, resource distribution, and governance systems shape human-environment interactions (WHITEFORD; CAIRNS; ZARGER; LARSEN, 2016).

The urban form of Amazonian cities reflects centuries of layered political-ecological transformations, including colonial land restructuring and extractive economies that have dispossessed and decimated Indigenous populations, entrenching inequalities that persist today (BARHAM; COOMES, 1994; CALISTO, 2017; LEONARDO TELLO IMAINA; FRASER, 2016; OLÓRTEGUI DEL CASTILLO DE RUMMENHOELLER, 2008). Rubber boom-era urbanization has had particular influence, with imposition of foreign architecture styles that sever cultural and ecological relationships with hydrological systems underfoot. (GREGORIO, 2022; OLIVEIRA, 2008). Together, these processes formed the formal/informal and highland/floodplain binaries that continue to shape policy priorities and resident experiences. Understanding these historical and structural foundations is critical for evaluating contemporary urban systems and identifying planning pathways that support ecological and social resilience across the urban Amazon.

2.3 Key Concepts and Definitions

This study integrates critical concepts including vernacularity, Lo-TEK (traditional ecological knowledge), and ecosystem services. Vernacularity is defined as design, materials, and spatial organization arising from long-standing place-based knowledge and environmental adaptation rather than top-down models (JIM COLEMAN, 2017). Vernacular communities may be formal or informal, low- or high-income, and hybridized, but share an underlying responsiveness to local ecosystems. This discussion aligns with Lo-TEK, a design movement positing that, when combined with Indigenous philosophy, vernacular architecture can generate sustainable, climate resilient infrastructure (WATSON, 2020). An ecosystem services framework supports analysis of design typology impacts. Ecosystem services are functions of natural environments that benefit human populations (e.g. flood mitigation, water purification, thermal regulation, habitat provision, food provisioning, disease vector reduction) (DANLEY; WIDMARK, 2016). Vernacular infrastructure often supports layered ecosystem services.

To articulate the spectrum of urban housing, this paper uses terms including substandard housing and formality (table 1). Substandard housing is defined in this exploration as housing that fails to meet UN-Habitat criteria for durability, sanitation, water access, overcrowding, and tenure security (UN-HABITAT, 2016). Formality is defined as legalization of housing and official recognition of land tenure. In theory, formality includes governmental adherence to provisioning of infrastructure to meet the UN-Habitat criteria for sufficient housing (UN-HABITAT, 2016), however this exploration reveals gaps in this support. As opposed to formality, informality can limit access to infrastructure and services, and, like formality, informality does not inherently preclude environmental or social benefits.

Table 1: proposed terminology for housing typologies with exemplary images from Iquitos

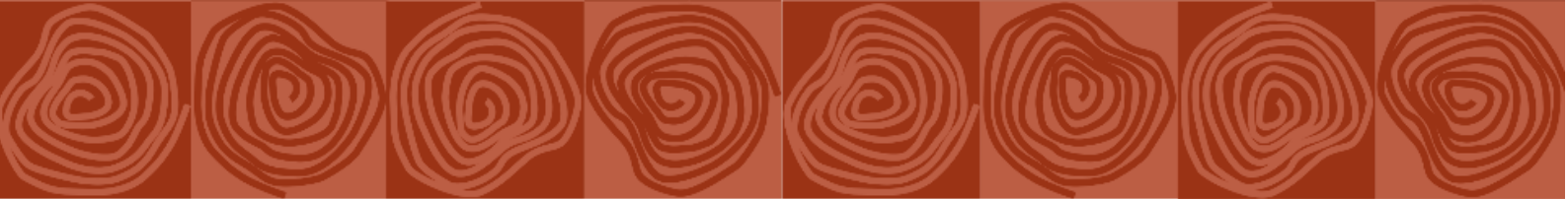
Term	Description	Exemplary image
En. <i>vernacular community</i> Pt. <i>comunidade vernácula</i> Es. <i>comunidad vernácula</i>	Housing including any of the following: 1) pre-colonial building techniques, 2) local, organic materials, 3) place-based climate adaptation. Vernacularity may or may not be substandard.	
En. <i>substandard formal housing</i> Pt. <i>habitação formal precária</i> Es. <i>vivienda formal precaria</i>	Planned and/or formal housing lacking any of the five UN-habitat for sufficient housing: 1) safe water, 2) access to sanitation, 3) durability of housing, 4) no overcrowding, 5) security of tenure(UN-HABITAT, 2016)	
En. <i>conventional housing</i> Es. <i>vivienda convencional</i> Pt. <i>habitação convencional</i>	Planned and/or formal housing based on (post)colonial architectural typologies that does not lack, relative to substandard formal housing, any of the five UN-habitat criteria for sufficient housing(UN-HABITAT, 2016)	

This conceptual framing positions vernacular communities in a multidimensional evaluative space, recognizing that housing quality, formality, and vernacular value must all be considered when assessing social, ecological, and cultural outcomes.

3. METHODS

The study employs a comparative, mixed-methods synthesis to evaluate the impacts of vernacular and conventional housing in Amazonian urban contexts. The analysis draws on previously published quantitative and qualitative sources to examine how housing typologies relate to social, ecological, and environmental outcomes. The approach emphasizes comparative evaluation across multiple dimensions, with particular attention to the influence of formality and housing adequacy on human and ecosystem well-being. Illustrative case studies from Iquitos are incorporated to ground the analysis, but the framework is intended to apply broadly to Amazonian cities.

Quantitative datasets from Iquitos were reviewed to understand population coverage, housing adequacy, and contributions to ecosystem services. Geospatial analysis was conducted to understand Iquitos floodplains and urbanization over time. Qualitative and ethnographic literature including case studies of floodplain communities and a relocation community were analyzed to understand cultural, social, and economic interactions within vernacular floodplain settlements. This mixed approach allowed the development of a comparative framework for evaluating vernacular versus conventional housing, integrating social, ecological, and formal/informal status dimensions. Careful attention was given to avoid romanticizing informal communities, recognizing that infrastructural deficiencies and economic precarity shape lived experiences.



3.1 Analytic strategy

Secondary quantitative and qualitative data were synthesized to assess vernacular and conventional housing along three intersecting dimensions: formality/legal recognition, substandard/adequate construction, and social/ecological contributions. Housing was classified based on formal/legal recognition and construction quality, with adequacy defined according to UN-Habitat criteria for substandard housing (UN-HABITAT, 2016). Ecosystem service contributions were quantified where possible using existing environmental datasets, while social benefits were derived from ethnographic accounts and survey data.

A comparative framework was developed in the form of a matrix to illustrate how vernacular communities can outperform conventional housing in terms of social and ecological outcomes despite informal or substandard status. The analysis also critically evaluates the limitations and vulnerabilities faced by these communities, emphasizing that high social or environmental value does not eliminate structural precarity, and highlighting the importance of supporting vernacular communities through inclusive urban planning.

4. RESULTS

The following results examine the social, ecological, and infrastructural outcomes of floodplain housing in Iquitos, highlighting the implications of relocation initiatives and the performance of vernacular versus conventional housing. Evidence is drawn from case studies, surveys, and comparative analyses to illustrate how community-based, adaptive infrastructure can support human and environmental health. Proposal of a comparative framework for valuing Amazonian infrastructure types follows.

4.1 Social and ecological impacts

The nuances of urban infrastructure are exemplified by studies exploring the impact of a floodplain relocation initiative in Iquitos. Bajo Belén, home to approximately 5,200 residents in 2,600 homes, is the oldest, largest, and most culturally and economically significant floodplain community in Iquitos (BARTRA, 2014; FALDETTA; REIGHARD; DICKINSON; WANG *et al.*, 2014; LEÓN, 2015). Citing unprecedented high water levels in 2012, (MOSCHELLA, 2019) Peru's Congress declared a state of emergency in Bajo Belén, authorizing initiation of the Nuevo Belén relocation project (EL PERUANO, 2014).

A pre-construction survey of Bajo Belén residents reported that approximately half said they would be willing to relocate (LA REPÚBLICA, 2015). By 2018, 397 homes had been completed and the first families voluntarily moved to the new highlands housing development approximately 20 kilometers (at least one hour by transit) from Bajo Belén and Iquitos' city center. Whether construction of the remaining 1,703 originally planned homes will occur is unknown.

A qualitative study examining attitudes toward living on water among residents of Bajo Belén and Nuevo Belén found that that residents perceived floodplain living not as hazardous but rather life-supporting, citing ecosystem services including provisioning of food, water, transportation, materials, housing, and economic opportunity associated with living on floodplains (LEANN ANDREWS, 2024).

A mixed-methods study compared housing quality, environmental indicators, and social indicators across Nuevo Belén, Bajo Belén, and another floodplain community in Iquitos, finding that floodplain communities scored highest on most social and environmental

indicators, with no significant improvements in the relocation community. Despite its formality, households continued to lack up to all five of UN-Habitat’s criteria for sufficient housing, electric and water utilities were incomplete, and unmanaged solid waste was abundant, reflecting the lack of state-supported waste management (GABRIELA VILDÓSOLA AMPUERO, 2021; LEANN ANDREWS, 2024).

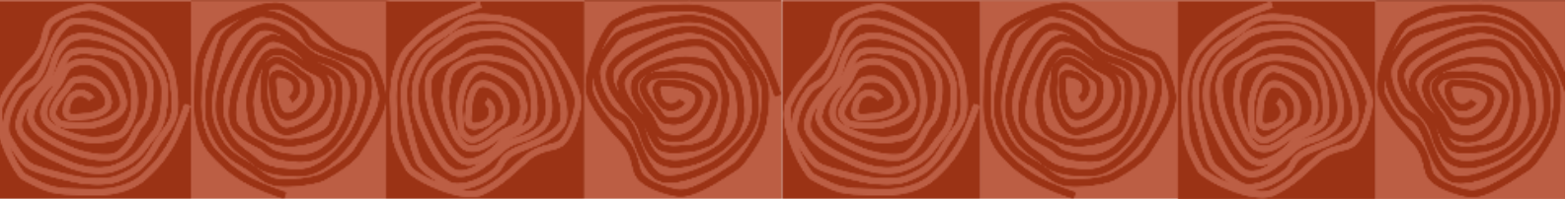
Environmental findings align with an exploration of environmental impacts of projects like Nuevo Belén, which necessitates destruction of white sand rainforest ecosystems—*varillales*—which serve as massive carbon sinks.(MOSCHELLA, 2019) Species endemic to the rare and delicate varillales, many of which are threatened, represent 83 percent of their biodiversity.(FINE; GARCIA-VILLACORTA; PITMAN; MESONES *et al.*, 2010) Only 18.05% of Peru’s varillales are preserved in protected conservation areas,(CENTRO PARA EL DESAROLLO DEL INDÍGENA AMAZÓNICO, 2018) such as the Allpahuayo Mishana Reserve outside of Iquitos. Nuevo Belén is cited within its legally designated buffer. Urbanization on Iquitos’ highland outskirts has the potential for severe environmental health impacts, the impacts of which are felt by communities locally and globally.

Furthermore, floodplain communities have been found to support ecosystem services beyond those that directly benefit community members by capturing aquatic plants, supporting riverine biodiversity, mitigating sediment accumulation, and providing water filtration.(ALARCÓN; ALARCÓN; ANDREWS, 2018; ANDREWS; FERNÁNDEZ; BACHMAN, 2021; GREEN FUTURES LAB, 2013) These findings illustrate the urban health solutions that vernacular floodplain infrastructure can provide while exposing the potential pitfalls of relocation.

4.2 Comparative framework for housing typologies

Table 2: typology matrix for valuing Amazonian infrastructure

	Vernacular housing		Conventional infrastructure	
	Substandard H=0; E=1	Adequate H=1; E=1	Substandard H=0; E=0	Adequate H=1; E=0
Formal H=2; E=2	H=2; E=3 Total=5	H=3; E=3 Total=6	H=2; E=2 Total=4	H=3; E=2 Total=5
Informal H=0; E=0	H=0; E=1 Total=1	H=1; E=1 Total=2	H=0; E=0 Total=0	H=1; E=0 Total=1



To Legend: H = health, E = environment. Higher scores (corresponding with darker colors) signify more robust support for human health and the environment.

summarize these findings, a matrix was developed to facilitate comparison of vernacular and conventional housing across three intersecting axes: legal/formal recognition, construction quality, and social/ecological outcomes (table 2). In this matrix, a higher total score signifies more robust support for health and environment. Health (H) and environment (E) receive scores from zero to two, where zero signifies harm and one or two signifies benefit. Scores for vernacular or conventional housing can be zero or one, and scores capturing formality/legality can be zero or two, positing that formal status is a stronger determinant of human and environmental health than housing typology on its own. Scores for health and environment are added for each combination to create a total score.

The matrix finds that formal, adequate vernacular housing has the greatest potential to support human and environmental health while informal, substandard conventional housing has the least. In between, different combinations of vernacularity, adequacy, and formality result in different scores, with vernacularity consistently scoring higher than its conventional counterparts.

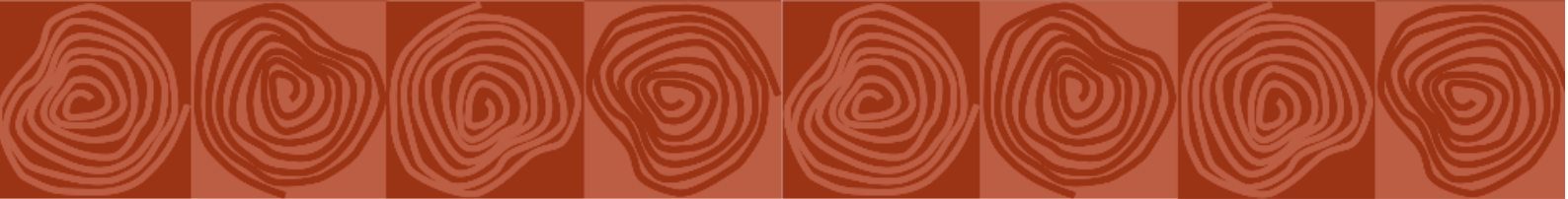
These findings challenge current assumptions that only conventional infrastructure can be formal and adequate. Vernacular housing often exists in informal or substandard conditions; however, these associations may result more from architectural hegemony—and the built environment policy that it reinforces—than from materiality or form. When political ecologies allow (e.g. when vernacularity is legal), vernacular infrastructure is well poised to outperform conventional infrastructure in terms of ecosystem services, social support, and climate adaptation.

5. DISCUSSION

This comparative review illustrates how architectural hegemony shapes contemporary built environment policy in Amazonian cities, finding that formal, conventional housing does not automatically produce superior social, ecological, or economic outcomes. Vernacular floodplain communities—typically labeled informal or substandard—often provide significant value that conventional highland models struggle to match. Recognizing floodplain habitation as a viable urban strategy is essential to achieve sustainability in Amazonian cities; housing hundreds of thousands of people across the Amazon basin, they offer a scalable and climate-adapted response to urban housing deficits.

5.1 Social, economic, and environmental health

Evidence shows that vernacular floodplain settlements generate multilayered social and ecological value. Socially, they sustain strong cohesion, preserve ethnobotanical knowledge, and support livelihoods embedded in river-based markets that link urban and rural economies. Their trade networks, subsistence activities, and cultural tourism circulate benefits far beyond the community. The provisioning of housing is particularly important considering ongoing urbanization and long-overextended formal housing. In cities around the world, self-managed communities exemplify housing solutions simply by providing shelter—of any quality—to large proportions of urban residents (POTTS, 2020).



The use of renewable and locally sourced materials in vernacular infrastructure reduces carbon emissions and mitigates the urban heat island effect, giving these structures climatic advantages. Floating and stilted homes have been found to control erosion while capturing vegetation to improve water quality—especially critical in Amazonian cities where insufficient wastewater treatment sends sewage directly to floodplains. Effective solutions will recognize the essential ecosystem services provided by vernacular communities while investing in place-adapted wastewater infrastructure to support human health across typologies. Evidence supports this approach: design-research has found associations between investments in floodplain community infrastructure and human and ecological health outcomes (ANDREWS, 2018).

This analysis has revealed that vernacular amphibious communities do not simply endure precarious conditions—they actively sustain ecological health and social well-being, functions rarely counted in standard housing assessments. Policymakers across the Amazon must recognize the social, economic, and environmental health benefits generated by vernacular floodplain communities and avoid replacing them with interventions that undermine urban health.

5.2 Relocation and architectural hegemony

Amazonian vernacular architecture operates as an integrated socio-ecological system, housing large populations excluded from formal housing markets and delivering ecosystem services such as water purification, biodiversity support, and thermal regulation. Yet vernacular living conditions are not uniformly desirable. Insecure tenure, limited support for infrastructure, and persistent economic precarity impose real burdens. The privileging of concrete, gridded layouts, and Eurocentric architectural forms continues to define what is considered “modern” or “adequate,” undervaluing the adaptive and ecological strengths of vernacular practices and reinforcing the marginalization of Amazonian traditional ecological knowledge. Nonetheless, floodplain communities are legitimate components of urban Amazonian systems, and are worthy of investment, rather than replacement.

Relocation policies reveal the limitations of conventional planning frameworks shaped by architectural hegemony. Relocation has not improved living conditions or environmental outcomes, but rather undermined local and global environmental health. Many residents return to floodplain communities, highlighting the mismatch between conventional housing design and socio-ecological reality. A hidden motivation may prompt relocation projects: removing low-income families from the sight and mind of the formal city. However, human rights violations and environmental impacts are among high costs of relocation, which does not prevent continued expansion of floodplain communities with continually growing demand for affordable housing.

5.3 Implications for policy and planning

This analysis underscores an urgent need to reconsider the role of vernacular floodplain housing in Amazonian urbanization policy. Promising hybrid and formal approaches already exist, as cities around the world explore communities on water as climate change solutions. (UNITED NATIONS, 2019) Designers continue to explore formal, adequate vernacular floodplain infrastructure, including award-winning Manaus-based *Habitação e Cultura Ribeirinha* (figure 2) (GREGORIO, 2022), *Casa Flotante La Balsanera* in Ecuador (BAMBA, 2023), and design explorations for Bajo Belén (DESMAlSON; BUONDONNO; VIOLA; GIACHETTA, 2019) and

Claverito community (ANDREWS; BACHMAN; BOON; COUGHLIN *et al.*, 2023) in Iquitos. These projects integrate stilting and floating technologies, organic materials, and participatory design to create climate-adapted, culturally grounded housing that supports health and identity.

Urban interventions should prioritize in situ support rather than relocation. Opportunities are particularly bright in cities like Iquitos where vernacular floodplain communities remain largely intact. Policymakers can leverage these existing housing solutions by establishing pathways for formal land ownership on floodplains, legalizing, regulating, and providing financial incentives for vernacular construction, and investing in the basic infrastructure systematically provided to formal neighborhoods (physical accessibility, wastewater treatment, solid waste management, and other utilities). Seasonally floating structures are particularly well-adapted to changing climates; regulation and support for stilted homes is needed to adapt many structures to anticipated future high-water levels (MARENGO; ESPINOZA, 2015).

Figure 2: Proposal for vernacular floodplain infrastructure for Manaus, Brasil



Source: Danielle Khoury Gregorio

Addressing architectural hegemony through anti-stigma campaigns and decolonial education can complement support a necessary paradigm shift in cultural acceptance of vernacular design. Finally, planning agencies should adopt socio-environmental impact assessments that account for ecosystem services, cultural continuity, community cohesion, and livelihood access. Recognizing these urban health co-benefits generated by vernacular floodplain communities, and integrating this value into planning processes, can align urban development with Amazonian environmental realities and help build more just, climate-adapted urban Amazonian landscapes.

6. CONCLUDING REMARKS

This work introduces and explores the concept of architectural hegemony to illuminate how dominant planning and design paradigms shape design policy in Amazonian cities. By introducing a comparative evaluation framework that accounts for vernacularity, formality, and adequacy independently, it provides a lens for a nuanced assessment of infrastructure that considers social and environmental impacts—aspects whose consideration is critical as designers and policymakers continue to address challenges arising from the concurrent and continual climate change and urbanization.

We have seen that informality is not inherently equivalent to deficiency. With appropriate legal recognition, technical support, and inclusive planning, vernacular housing can be strengthened without erasing its ecological and socio-cultural contributions. When evaluated for social and environmental performance, vernacular floodplain communities offer substantial contributions to ecosystem services, community cohesion, cultural preservation, and climate adaptation.

Conversely, relocation and conventional housing approaches frequently prioritize aesthetic or political considerations over social and ecological benefits, with limited long-term success.

By situating vernacular practices within formalized planning and policy, cities across the Amazon can reframe urban floodplain communities as assets rather than liabilities, recognizing their inherent ecological knowledge and climate resilience. This reframing has the potential to inform broader Latin American and global conversations about informal housing, urban adaptation, and sustainable design. Continued work should integrate participatory design-research approaches and further assess and analyze the socioecological impacts of different Amazonian infrastructure typologies. In doing so, Amazonian cities can move toward inclusive and sustainable models of urbanization.

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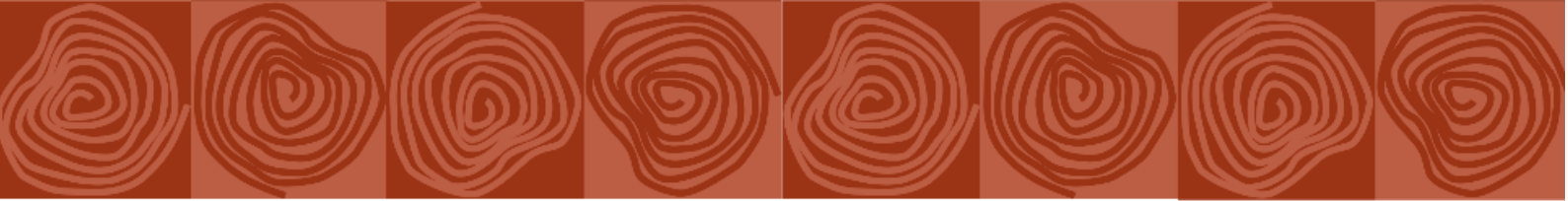
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