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Towards an Amazonian Urbanism
Collective Infrastructures of Care

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In the everchanging and mobile territory of the Amazon rainforest, the imposition of a rural-urban divide results in the unsustainability of settlements that appeared as sites of extraction at the turn of the twentieth century. Accelerated changes and transformations in urbanisation patterns and in climatic conditions call for the necessity to explore alternative city-making models that are better able to adapt to and promote multiple ways of being and of interdependence between humans and nature. The lifestyles and worldvisions of Amazonian urbanites already speak of the

Amazonia: dynamic territories and multi-sited households

Settlements in the Amazonian Rainforest, their immediate connectivity with and dependency on the forest, the dynamic mobility of inhabitants in and out of the city, and their lifestyles are a perfect example of the impossibility of maintaining a rural/urban divide as if the two were opposites. Christine Padoch has written and carried out extensive research on what she and her colleagues describe as urban forests and rural cities (Hecht et al., 2014) and the mobility and dynamism of populations that live in multi-sited households as they travel frequently from the city to the forest and have extended families that share various dwellings (Padoch et al., 2008). The vast biodiversity of the Amazonia and its unique climate are incompatible with the urban-rural dichotomy due to the interdependency of human settlements with their

possibilities of reimagining what Christine Padoch calls 'urban forests and rural cities.' Through collective experimentation, we depict how the co-production of collective infrastructures of care could allow strengthening the relational socio-natural practices needed for a reconfiguration of Amazonian urbanism.

environment. This imposed division is impossible within worldviews for which the human and natural dichotomies are non-existent as explored by Viveiros de Castro (2015, 2012) and Kohn (2013).

When referring to the Amazonian Rainforest in particular, the work of Bertha Becker (Becker, 2013, 1985; Becker et al., 1990) calls for the necessity of new ways of understanding and planning cities and settlements to adapt to a dynamic and ever-changing territory and of ways of inhabiting it that respond to and are shaped by these unique characteristics. The interconnectedness between nature and humankind is made even more clear in the fact that, traditionally, Amazonian identity has been shaped by a non-Western worldview in which the distinction and hierarchies between 'human' and 'non-human' is blurred. Amazonian cities, a relatively recent phenomena, are sites where these traditional worldviews meet others which see the rainforest as resources to be extracted and exploited. In cities that are engulfed by the forest, urbanites still preserve, to various degrees, 'rural' ways of being in what Gasché describes as urban 'bosquesino' (from the forest) societies (Gasché, 2015; Gasché and Vela, 2012, 2011). Human settlements, particularly cities like Iquitos, Manaos and Belem, are still in the process of adapting to this territory and ways of being. In times of accelerated social, territorial, and climatic change, the continuous imposition of urban models and ways of being that render invisible this symbiosis and interdependency represent a challenge manifested in the construction and expansion of urban settlements that are unable to adapt to this territory (Desmaison, 2019).

The stability and sustainment (Fry, 2017) of cities in this fragile and dynamic territory is put into question as current models and ways of city-making brought from other contexts, such as seeking permanent and static infrastructure dependent on interconnected networks and grids, are unable to adapt to a territory constantly in motion due to the changing course of its rivers and seasonal flooding that brings the water level over five metres between seasons (Moschella, 2019). Rapid urbanization and loss of rainforest is happening

at the peripheries of the cities as informal settlements grow exponentially following settlement patterns of Latin America, one of the most urbanized regions of the planet with over 80% of its population living in urban areas[1] (Alexandri et al., 2016; Hernandez et al., 2010). The accelerated growth rate of urban areas has reinforced the capitalisation and degradation of nature and the territory. The government is unable to respond to this speed of growth in the implementation of grid-like systems for the provision of water and sanitation, with high economic costs and negative social and environmental impacts. Thus, facing the impossibility of maintaining the urban-rural dichotomy, exploring alternative forms of city-making towards the configuration of cities and settlements capable of responding to both ecological and socio-cultural dynamisms becomes urgent to prepare for the accelerated future changes of rapid urbanization and climate change (Bachman, 2020; Cardoso, 2010; Mcsweeney and Jokisch, 2015).

Amazonian Cities: cycles of extractivism and uncertain futures

The history of cities in the Amazon is entangled with a history of extractivism and colonialism. The rulers and elites of the young Republic of Peru saw a business opportunity in the extraction of rubber at the turn of the 19th century. The exploitation of this resource led to a violent period of slavery and cultural obliteration for the native communities of the forest (Chirif, 2015) accompanied by the emergence of port-cities like Iquitos, Manaos, and Belem (Ortiz, 2015) which were designed with a European grid and with Portuguese architecture (Ríos and Durand Lopez, 2015). Simultaneously, those that were able to escape the *Reducciones* (camps that forcefully brought together people from diverse tribes) formed the first floating settlements next to the 'formal' city. An example of this is Belén (Reátegui, 2015), a floating neighbourhood that preserves vernacular architecture made of wood and palm leaves and that was once on the periphery of Iquitos but has now been engulfed by its continuous expansion. We see how, from their inception, Amazonian cities, and Iquitos, were configured by the encounter of two worldviews of territory and space alike: one that emphasized the conviviality and interdependence between humans and non-humans and one that saw the territory as a site of extraction. This clashing led to a distinctive type of urbanites with various degrees of 'rural' connections with the forest as shown in their lifestyles, their leisure activities, and their livelihoods (Ramírez, 2015).

Iquitos was funded as an extractivist city, which we define as a settlement whose main purpose is to become the administrative centre for the extraction and importation of raw resources, that is a site where division rather than conviviality between humans and nature

is what preconditions the urban form. A linear rather than a cyclical and interdependent understanding of the ecosystem leads to an unsustainable exploitation of resources. This, accompanied by a limited care and investment in local capacity building and wellbeing, results in the history of Iquitos being marked by cycles of economic prosperity and poverty. Prosperity comes when there is a sudden increment in the global demand of a particular resource like rubber or oil, but it quickly vanishes when that resource is no longer sought after. It is also important to mention how the economic and social gains in times of prosperity are not shared equally and usually benefit an elite, with very little retribution to those not directly linked to the extractivist industry, with a very limited investment in repairing and improving the city's infrastructure and access to basic services and accompanied by the exploitation of marginalized groups and the pollution of the forest. When the 'boom' is over, the precarity of the living conditions of the city, and the unsustainability of the dependence on the extraction of resources is highlighted. Hence, there is a need to offer alternative livelihoods which are both socially just and environmentally sustainable (Piva da Silva, 2017). This calls, once again, for the need towards alternative modes of urbanization and settlement-making that are able to adapt to the territory, to the urban-rural mobility and fluidity, and to the difficulties of achieving agricultural activities given the poor soil condition for crops, calling for a different kind of food production in the most biodiverse forest in the world (IIAP, 2009).

Towards alternative urban design in Amazonian cities

Arturo Escobar, in his *Designs for the Pluriverse* (2018), calls for the recognition of the multiple conceptions of 'worlds' as experienced by diverse groups of people. The author argues how design, as of now, responds mainly to a particular worldview and way of being which has been proven to be unsustainable both socially as well as environmentally. Given this, design must be reconceptualized so that it is better able to respond to the multidimensional transitions the world is experiencing, moving from a dependency on "the life-stifling dualist ontology of patriarchal capitalist modernity toward relational modes of knowing, being, and doing" (ivi, p. xi). Thus, in the case of settlements in the Amazonia, it is not about 'recovering' indigenous knowledge as it is multiple and diverse, but about consciously integrating it in the ways cities and settlements are designed, implemented, and maintained. It is also important to recognise that indigenous knowledges (in their multiplicity) are intertwined, influenced by and influence other worldviews, hence creating a multiplicity of experiences or a pluriverse.

There are extensive studies, particularly in anthropology, of the diverse understandings

of the world in rural areas in the Amazonia (Athayde et al., 2017; Kohn, 2013; Viveiros de Castro, 2015, 2012) although much less so on the diversity of experiences and worldviews of Amazonian urbanites (Mcsweeney and Jokisch, 2015). Moreover, the Amazonia is a site where the rural-urban divide becomes blurred, speaking instead of an interconnected network or rural-periurban-urban flows, both physical and socio-cultural, (Brenner and Katsikis, 2020; McGee, 2017) in which not only land but also rivers take part in the configuration of amphibian cities (Bachman, 2020). Water here is understood and experienced as a means for mobility and connectivity, a source of livelihood (fishing), and as a source of spiritual and symbolic significance.

In spite representing a significant portion of the city of Iquitos, planning instruments like the *Plan de Desarrollo Urbano* (Urban Development Plan) (MPM, 2011) often renders them invisible. Moreover, there are currently no solutions being implemented towards the provision and access to basic services in flooding neighbourhoods, even though they are present in cities like Iquitos but also in smaller settlements connected to the city through the rivers. The alternative understanding and continuity between rural and urban in Amazonian settlements, as well as the interdependence between the productive and symbolic understandings of the river and the forest, call for a reconfiguration of Amazonian urbanism. This includes rethinking infrastructure delivery beyond its material quality and beyond its grid-like delivery to serve periurban neighbourhoods and interconnected dispersed settlements (de Valencia et al., 1999). How can design be effective in the production of pertinent and appropriate infrastructure for Amazonian urbanites?

Co-produced infrastructures of care towards inhabitation

A possible point of departure in reconfiguring Amazonian urbanism is to explore the links between infrastructure, presented here as "dynamic patterns that are the foundation of social organisation" (Power and Mee, 2020, p. 484). Moving beyond technocratic and material understandings of infrastructure, a relational understanding which connects infrastructure to care and affect opens up the possibilities of exploring the ways in which materialities shape and are shaped by socio-cultural practices. As socio-technical systems, infrastructures "pattern social life and identify the values that are selectively coded (...), (re) producing social difference through use" (ivi, p. 485). Whereas Power and Mee focus on housing as an infrastructure of care, Klinenberg (2018) explores how, the provision of collective infrastructure (i.e. community centres, libraries, etc.) allows strangers (neighbours) to meet, form relations, and take care of each other. In times of crisis, these everyday relations, which Klinen-

berg refers to as 'social infrastructures' are fundamental for civil society to act as first responders before public institutions are able to (Solnit, 2009).

Expanding on Klinenberg's terminology, we would like to argue that material infrastructure needs to arise and respond to local contexts and everyday collective practices, challenging current planning processes with a limited understanding of other ways of being and inhabiting, resulting in the implementation of ill-equipped infrastructures to meet contextualised everyday needs and practices. In the case of the Amazonia, a good example is the implementation of grid-dependent infrastructures for basic services and the proliferation of housing that denies and limits collective caring activities. Rather than copying solutions that were designed and planned elsewhere but which may not be entirely appropriate for diverse ways of being and inhabiting, Amazonian urbanism and infrastructure should seek to find its own identity. With this approach we seek to avoid the implementation of objects that fail as infrastructures because they are "too difficult to use or integrate into existing practices and/or are not sufficiently appealing to transform practice" (Power and Mee, 2020, p. 488).

The capacity of infrastructure to transform practice speaks of its inherently political nature. On one hand, the provision of certain kinds of infrastructure by public institutions intentionally created differential access, use and adaptability which (re)produces social inequalities (Ibidem). However, inhabitants are not passive subjects, as seen in the ways in which they reimagine, reinvent and readapt infrastructures, giving rise to new ways of inhabiting and governing urban spaces and settlements (Amin, 2014). The political potential of infrastructure lays in how it is capable of showing and fostering alternative ways of living and of governing resources (both material and social). The exploration of the political disruption potential of infrastructure, along with the materialisation of matters of care and affection towards the socio-natural, opens up the possibility of engaging with the much needed reconfiguration of alternative urbanisation processes towards 'urban forest and rural cities' (Padoch et al., 2008).

Commoning and inhabitation are concepts that help us to envision what those alternative ways of being might be. Both terms depict the emergence of alternative ways of governing, of co-existence, and of managing social and material resources (Boano and Astolfo, 2020; Darcy and Rogers, 2014; Escobar, 2019). De Angelis describes 'commoning' as an "ongoing flow of constituent of rights, common rights, which are not 'granted' by the state, by the powerful, but that originate in their *being exercised* (...). Commoning thus occurs *within, against and beyond citizenship*" (original italics, 2019, p. 628). For Boano, inhabitation means "re-cen-

tring the affirmative dimension of enduring relations and develops an idea of collective life that tenaciously responds, non-negatively, to aspects of life and to modes of living, extractive practices and constructs different horizons of hope" (2020, p. 8). Through both commoning and inhabiting silent individuals "become active and powerful collectives, appropriating and inhabiting urban, social and political spaces" (Dadusc, 2019, p. 599). While commoning calls for the recognition of alternative ways of governing and managing resources that exist within and beyond sovereign power, inhabitation refers to the continuous processes of collective relations between humans, non-humans, and space that endure life and allow commoning to take place. The collective design, implementation, usage, and maintenance of infrastructure of care is an exercise of inhabitation that creates platforms for the realisation of commoning.

Amin explains how informal infrastructural development challenges current power hierarchies "by adding more modes of organization and action into the political arena" (2014, p. 156), thus becoming "sites for political contest and change" (Power and Mee, 2020, p. 489). We would like to make the argument that the political and transformative value of social and/or caring infrastructures is not always necessarily linked to tensions and conflicts between inhabitants and those in power, particularly the State. The co-production, as a horizontal process with the engagement of citizens and public representatives, can also give rise to instances of political contestation through the collective construction of alternative ways of planning, implementing, and governing infrastructure. Mitlin and Bartlett (2018) explain how co-production led to service delivery that is more effective in that it leads to the production of more pertinent infrastructural solutions, the strengthening of the capacities of inhabitants, the creation of collective processes of care and maintenance of material infrastructures. The combination of the previously mentioned conditions led, in turn, to improved relationships between citizens and local governments.

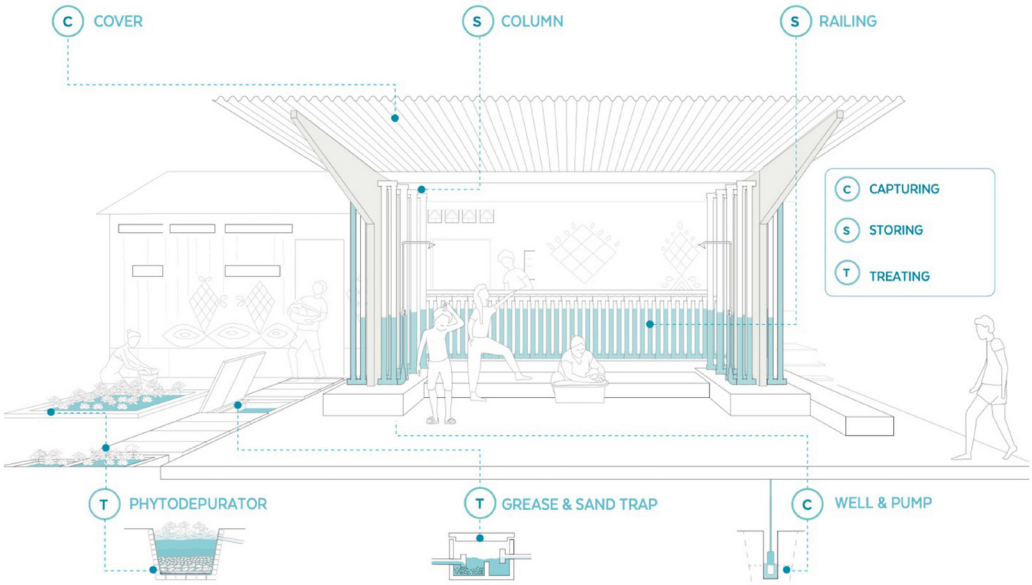
Co-production is a process that emphasizes the strengthening of the relationships between agents, through a change in current power relationships. Hence, the collaborative process is more important than the final object itself as it offers a renewed vision of shared responsibilities and recognition of a multiplicity of voices in city-making. Building something together also offers the opportunity of reconnecting inhabitants with the physical space, thus promoting care between humans, non-humans, and the environment. Within that renewed social and material connectivity, the maintenance and repair (understood as caring practices) of infrastructure lead to the sustainment of communal ties and brings actors together in a renewed sense of citizen-

ship, thus representing political practices in themselves (Lynch, 2014).

The co-production of infrastructures of care can be, as a first instance, promoted through experimentation, which seeks to promote change through the creation of "spaces of containment and exception in the city and their dynamics" (Bulkeley et al., 2014, p. 19) and "purposively attempt to change both the material arrangements and the culture, norms and conventions" (ivi, p. 22). However, the success of experimentation depends on its ability to acknowledge and incorporate already-existing materialities, politics, and economies so that they become pertinent alternatives to the urban socio-technical systems which they seek to transform. Experimentation, through co-production, has the potential to bring together a diversity of agents to discuss and test alternatives towards transformative practices for fairer cities. For experiments to occur political will and support must be present, not only to secure the legitimacy of the project but also to maximise its potential to transform wider processes of institutional and social learning by assuring their linkages to broader outcomes of city-wide vision of planning and development (Castán Broto et al., 2019). Hence, actions and projects carried out without the participation, support, and involvement of public institutions are unlikely to foster change at the broader political and policy levels.

As Mattern (2018) explains, if we apply 'care' as a "framework of analysis and imagination for the practitioners who design our material world, the policymakers who regulate it, and the citizens who participate in its democratic platforms, we might succeed in building more equitable and responsible systems." As Schwarz and Krabbendam point out, "it is no longer a matter of designing for society, but within it" (2013, p. 6). Furthermore, the city is conceived as an agent since agency "is not only located in organizations and individuals but socio-materially constituted" (Bulkeley et al., 2014, p. 238).

Thus, the experimentation of co-produced infrastructures of care opens the possibilities of breaking cycles of fragmentation and individualising practices to transform current governance and planning through the construction of a shared collective identity materialised in space. Within that framing, we present the co-production of infrastructures of care as a possibility to collectively disrupt the rural-urban dichotomy, which frames nature as a site of extraction in an unsustainable lineal form, to envision an alternative Amazonian urbanism that recognises and integrates the interdependency between society and nature.



Collective infrastructures for an alternative Amazonian urbanism

In an everchanging and mobile territory, cities and settlements must also be dynamic. The permanence of the built environment, both as buildings and infrastructures, sought after in the predominant form of urban and architectural design cannot adapt to this territorial dynamism. Currently, 22.7% of the population of the city of Iquitos does not have access to drinking water and 56.7% does not have sewerage service (EPS-SEDALORETO, 2021). This is particularly true for marginalised periurban settlements in which the rapid urbanization rate far exceeds the state's capacity to provide access to water and sanitation. It is ironic that, in one of the places with the highest rainfall and home to the largest river in the world, the population has problems accessing water. The lack of an urban model that is more adaptable to the components of the water cycle has generated various problems such as floods in the city's treatment plant and the collapse of street drains during the high rainfall season. Current city-making also fails to recognise the strong social and spiritual connections between Amazonian urbanites and water (Brandshaug, 2019).

In that context, the multidisciplinary team of CASA [Ciudades Auto-Sostenibles Amazonicas] | HOME [Self-Sustainable Amazonian Cities][2] seeks to co-produce alternative and

Components of the Capture, Storage and Treatment (CST) water system in the community showers and laundry.
Fig. 1
Produced by the CASA Team, 2020.

autonomous infrastructures of care capable of facilitating access to basic services but also reconfiguring the understanding of public and communal spaces in Amazonian cities. These spaces recognise and promote already-existing collective activities and emphasize the connection between people and forests. The maintenance and repair of these infrastructures are led by inhabitants, who not longer depend on the State for the provision of basic services. Their autonomy is seen in how they are not dependant on a grid like system and that they could eventually be dismantled and rebuild elsewhere.

Ritama Uni[3] is a communal laundry and shower space carried out by the Municipality of Maynas, chemical engineers from the National University of the Peruvian Amazon (UNAP), architecture and sociology researchers and students from the Pontifical Catholic University of Peru (PUCP) and the residents of *Venecia* Street, in Santo Tomás, a fishing neighbourhood, in Iquitos. The project aimed, from the beginning, to work in collective spaces rather than in private households towards the collective and continuous exploration of Amazonian infrastructures of care (Desmaison, 2021). Residents participated in the construction process and trained for its maintenance and for replicating the project in other places. A management committee was established, composed of community residents, strengthening the sense of ownership and responsibility of citizens themselves towards the care of the collective infrastructure. Hence, the proposal seeks to expand understandings of 'care' by providing platforms not only for promoting and facilitating collective activities of domestic care but also for the generation of awareness on caring for the environment and, simultaneously, exploring alternative, horizontal, and inclusive forms of governing and managing resources that foster renewed feelings of belonging and ownership within residents.

The experience reveals the effectiveness of community participation in the development of socially relevant and environmentally sustainable design proposals. The exchange and collaborative work between different groups of people (citizens, academic researchers, and public officials) generates alliances that strengthen the project and the fulfilment of a collective vision. The process generated evidence of the social, environmental, economic, and health benefits that these types of initiatives provide. A pending work, carried out in the continuation of the relationships of trusts built between the participants, is to able to replicate the experience, both the process and the technology. Likewise, we seek a better integration of participatory processes in the design and implementation of social and development policies and programmes and in the implementation of public infrastructure and equipment that are socially relevant.

Children enjoying the showers of Ritama Uni.
Fig. 2
Photo by Jorge Soria, 2019

This experience shows how an active presence of the citizens themselves fosters a sense of belonging and co-responsibility towards the success and sustainability of infrastructural projects. The emphasis on both the process and the result creates opportunities for the strengthening of knowledge and capacities of both the citizens themselves and the representatives of public institutions that we hope will allow better opportunities for individual and community development.

Discussion

Amazonian cities posit great challenges to those communities affected by economic recession, settled on flood-prone areas and at risk of relocation. But reality is much broader than this. Amazonian urbanism and settlements help us to think of a different urbanisation: flexible, adaptive and temporal, more similar to the tradition of the disperse settlements of native communities. An urbanism in flux characterised by interconnected mobilities and heterogeneity (Browder and Godfrey, 1997); and its open spaces should not be purely private nor merely public and should be understood as in-between spaces, reproduced through mobility that is constitutive of this urbanity in flux.

The on-going CASA | HOME project, even if presented briefly here, has been a platform for action research that seeks to co-produce alternative and autonomous infrastructures of care capable of facilitating access to basic services but also reconfiguring the understanding of public and communal spaces in Amazonian cities. These spaces recognise and promote already-existing collective activities and emphasize the connection between people and forests. The maintenance and repair of these infrastructures are led by inhabitants, who no longer depend on the State for the provision of basic services. Their autonomy is seen in how they are not dependant on a grid like system and that they could eventually be dismantled and rebuild elsewhere. Even if smaller in scale, CASA was able to rethink new relationships between rural and urban spaces by rethinking settlement practices in areas where those relationships are already blurred due to constant mobility and interdependence.

Human exists insofar as they inhabit, as they can never avoid existing and thus transforming space into a place, even when this space is tragically uninhabitable. Humans inhabit by transforming an imperfectly and abstract space in some way, imprecise and precarious, into a place that generates the possibility of intimacy understood as the possibility of welcoming and being welcomed. Inhabiting is the way in which that particular living being that is human modifies existence by living as human, that is to say according to her own specific way of being. The term *Bauen* (Heidegger, 1975), which translates as building in the sense of dwelling, but also of preserving and culti-

vating, which does not mean producing but protecting. This is the interesting meaning of dwelling, which implies preserving and cultivating, shifting the focus not only on simply being, staying and existing, but by opening a more complex 'ecology'. The point is thinking the creative process through which inhabitants withdraw from death to escort it, constituting an industrious community capable of building, maintaining and repairing its living space.

An important element is not to think of living as separate from cultivation and care. Living always has to do with otherness, with the surplus of an otherness that is not constructed but preserved. With and beyond Heidegger's dwelling (1975), with a focus on life and living (collectively)– central to any serious discussion on housing and urbanism – need to be extended beyond anthropocentrism to embrace a more vitalist materialism – to avoid the rela-

tivist idea of the existence of a multiplicity of forms-of-life. Inhabitation thus becomes the territory where practices of care, repair and imagination forge renewed politics and an ontology of the living. The forms-of-life that presuppose inhabitation, become the central idea to help us think how we practically live together and how the norms and the tactics of such life get formed in and through space. Inhabitation means re-centring the affirmative dimension of enduring relations and develops an idea of collective life that tenaciously responds, non-negatively, to aspects of life and to modes of living, extractive practices and constructs different horizons of hope in which the rural-urban divide becomes obsolete.

Unlike infrastructural thoughts, landscape and in some ways design, the Amazonian urbanism does not enclose spaces and relations. It does not enclose in synthetic forms but offers an ecology of the possible. Amazonas settlements are not the form, pure, purified or not, of the synthesis between the power of the project and the capacity of the body, but the effect of the compositions of events, an event among events, a consequence, an effect, an essence that is traced in accidents. Amazonian urbanism is an emerging territory where life is played out in the limitedness imposed by the surroundings and the occasions, therefore in a perpetual ambiguity, situated in this tension between life and nature in some way and environment where nature, the environment is not an original endowment but the place of a contingency. A contingency that derives from renouncing both Prometheanism and naturism, that is, from thinking of life as fragile and vulnerable (ontological and existential fragility), that is, from becoming aware of a human nature thought of as a constant interweaving of activity and passivity power and vulnerability in its continuous coming to terms with its surroundings. Here, surroundings are not simply seen as territories of objects of spaces, but as the non-possible and the possible converging in a mysterious interweaving in a subtle enigmatic convergence.

Note

[1] See: https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?locations=ZJ
[2] For more information visit: www.casapucp.com/casa2020/
[3] Ritama Uni means "Community Water" in Kukama-Kukamiria, an indigenous language spoken in the Peruvian Amazon. Residents of Venecia Street are descendants of the Kukama-Kukamiria.

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