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Informal habitats and participatory processes in the construction of common spaces in the *Asentamientos Humanos* in Lima

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Informal settlements are a global urban phenomenon that affects a substantial share of the world's urban population. A significant part of the world's urban future is unfolding in the informal megacities of South America, Asia, and Africa, where conventional models of urbanism have been replaced by diverse forms of informality. This paper focuses on Lima, where informal settlements known as *Asentamientos Humanos* constitute nearly 70 % of the urban fabric. *Asentamientos Humanos* are characterised by high human density, a lack of adequate services and infrastructure, and vulnerability to the effects of climate change. However, they are also places of architectural and urban experimentation, supported by incremental approaches and community practices that encourage participatory and self-organising spatial processes. Many initiatives rely on collective efforts to shape space, with growing attention to shared water management. This study examines several initiatives within Lima's *Asentamientos Humanos* using qualitative, empirical, and interdisciplinary approaches, alongside site visits, photographic and sketch documentation, and interviews with residents. Case studies were selected to represent typical settlement typologies, land conditions, and participatory projects. This research identifies spatial and social strategies that support adaptation to environmental, economic, and political challenges, highlighting how collective and incremental processes can foster resilient housing, social cohesion, and adaptable solutions in resource-constrained contexts.

Keywords: informal habitats, self-built architecture, sustainable design, participatory processes, water management

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Introduction

Informal habitats are the symbolic outskirts of many planned cities[1] (UN-Habitat, 2003; Davis, 2006). Today they are beginning to become larger than the objects that they used to limit, i.e., the planned cities themselves. This change of proportions has collapsed narrative dualism between the so-called formal and informal, which was used to justify the application of the standard criteria of formal cities to self-built settlements as the only possible solution to solve their problems (Roy, 2005; Roy & AlSayyad, 2004).

This paper presents a disciplinary reflection on the broad phenomenon of spontaneous settlements in emerging countries, and considers them as an integral part of spatial and urban planning discourse. This paper therefore addresses informal habitats as a normal structural form of human habitation rather than a form of emergency housing (Turner, 1976; Hamdi, 2004). These settlements show complex, context-based, adaptive, and non-unique patterns of development in which traditional, as well as vernacular or precarious housing models, are combined with responses to context-based needs. Recurring spatial and typological patterns in domestic and collective spaces emerge from the participatory and resource-conscious use of limited means; revealing underlying principles of the self-constructed city[2] (Alexander et al., 1977; Rapoport, 1969). In contexts of widespread material scarcity, such practices often embed forms of circularity, cooperation, and incremental growth into everyday life; offering relevant insights for architects and urban planners confronted with contemporary conditions of rapid urbanisation, inequality, and social transformation (Simone, 2014).

The experience of the informal habitats of Lima – *Asentamientos Humanos* – in the coastal desert of Peru, constitute the main case study of this research. Today, the Lima-Callao metropolitan area[3] includes approximately 3,000–3,200 *Asentamientos Humanos,* and it is estimated that around 60–70% of the urban population lives in informal settlements (INEI, 1994; Acevedo-De-los-Ríos et al., 2024). These settlements occupy a significant share of the urbanised area (INEI, 2020); highlighting the scale and importance of informal urbanisation in the city. Their formation is closely linked to the large-scale internal migration that has taken place throughout the 20th century; driven by geopolitical instability, environmental vulnerability, and particularly internal armed conflict[4], as well as by expectations of improved security and living conditions in urban areas (Turner, 1968; Driant, 1991). These migrant people have built their temporary settlements close to the consolidated city, and in so doing have created an interesting model of self-construction and participation in civic and political life, while also still adhering to forms of collective knowledge and temporary uses rooted in their culture of origin.

[1] In this context, *planned cities* refer to urban settlements shaped by formally codified planning principles and regulatory frameworks that emerged from the late 19th century onward. While cities throughout history, including many medieval European settlements, developed through incremental and adaptive processes, modern urban planning, strongly influenced by hygienist and rationalist paradigms, introduced normative distinctions between legitimate and illegitimate urban forms, thereby reinforcing the divide between formally planned cities and self-built or unregulated settlements (Choay, 1965; Hall, 1988).
[2] The principles of the self-constructed city describe bottom-up processes of urban production in which inhabitants actively shape housing and urban space through incremental, needs-driven practices, challenging the notion of informality as merely the absence of planning and highlighting residents' agency in city-making (Hernández et al., 2023).
[3] The province of Lima and the constitutional province of Callao make up the Metropolitan Area, an entity created by decree in April 1972. This area represents 2.6 % of the country's total territory and is home to 30 % of Peru's 33.7 million people today (2017 census).
[4] Rural-to-urban migration in Peru, particularly toward Lima, began in the early 20th century but intensified during the late 20th century due to the internal armed conflict associated with the Maoist insurgency of *Sendero Luminoso*, which lasted until 2000. Originating mainly in Andean rural regions, the conflict generated widespread displacement toward major urban centres (CVR, 2003).

The Peruvian case is also significant because of early institutional recognition which began in the 1950s with regards to the limitations of conventional social housing policies in addressing large-scale housing shortages. This awareness prompted architects and planners to explore alternative and more participatory approaches that involved multiple stakeholders. This culminated in experimental programs such as PREVI (*PRoyecto Experimental de VIvienda*) during the 1960s and 1970s. These initiatives contributed to redefining housing as an incremental and socially embedded process and have influenced subsequent understandings of spontaneous settlement formation and management.

Methodology and objectives

From a methodological perspective, this paper adopted qualitative and empirical approaches which identified spatial, architectural and social characteristics of informal settlements that may constitute not only vulnerabilities but also valuable assets. Informal urbanisation is interpreted as a necessary form of adaptation to climatic, economic, and political conditions (Dovey et al., 2023*;* Atkinson, 2024; Jones, 2017), and is particularly evident in the material frugality and constructive simplicity that enables habitation in extreme environments such as the Peruvian desert coast. The research undertaken for this paper combined field observations, photographic and sketch documentation, and semi-structured interviews with local residents, with a focus on urban morphology and housing typologies as well as their responses to topographical constraints, accessibility issues, infrastructure scarcity, and patterns of social organisation. Artificial Intelligence (AI) tools were used to improve the clarity and readability of the manuscript and to support the verification of source consistency and reference accuracy. All content and final revisions were reviewed and validated by the author.

Within this study, special attention is given to settlements that are located on steep or peripheral terrains near consolidated urban areas of Lima, where land availability and affordability generate recurring spatial challenges related to circulation, safety and service provision. In addition, the study documents community-led initiatives and self-construction practices, and in so doing highlights the active role of inhabitants in adapting and upgrading their environments. An interdisciplinary framework supports the analysis by integrating architectural and landscape studies with social research and anthropological perspectives in order to account for cultural practices, collective knowledge and participatory dynamics that shape settlement development.[5] Several representative case studies were selected to reflect typical morphologies and growth strategies (Figure 1).

Empirical investigation began in 2018 with fieldwork and a workshop conducted in Chorrillos, in the southern suburbs of Lima, specifically in the *Urbanización de* San Genaro and the *Asentamiento Humano* Colinas del Pacífico-hijos de Miyashiro, which occupies the slopes of the neighbouring hill. These initial experiences provided direct insights into the spatial, social, and environmental conditions of informal settlements. Although this work is connected to a broader PhD research trajectory (2020-2024) at the University of Palermo on processes of spatial self-construction in informal contexts shaped by migration, the study in Lima developed as a side-project that informed and complemented this research framework. Within this framework, informal and temporary forms of dwelling were further examined in relation to theories of ephemeral and incremental urbanism (Bishop & Williams, 2012; Mukhija & Loukaitou-Sideris, 2014), as well as to historical precedents such as the *bidonvilles* of Casablanca and Algiers documented by members of GAMMA, ATBAT-Afrique and CIAM-Algiers (Avermaete, 2010).

[5] Examples include mapping housing typologies and slope usage (architecture/landscape); documenting communal decision-making processes (social studies); and recording cultural practices affecting household layout and shared spaces (anthropology).

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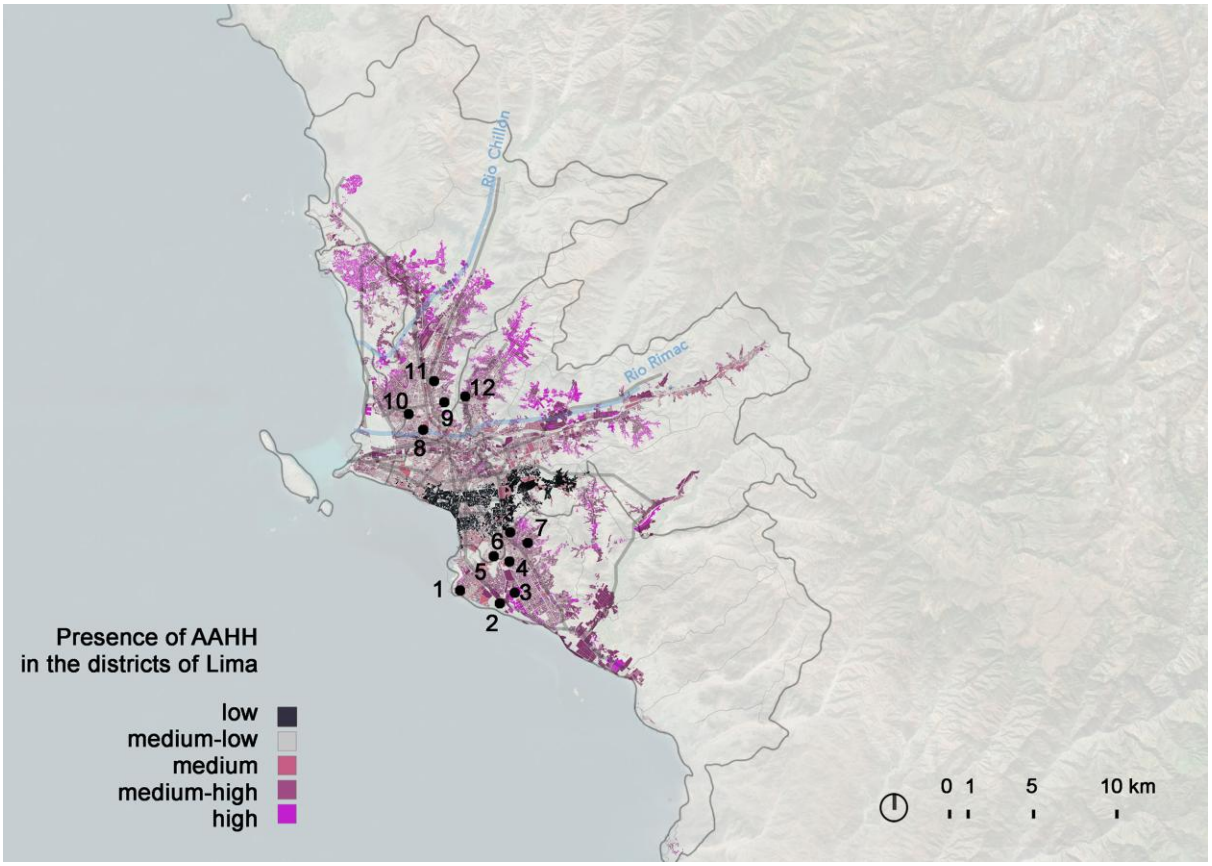

Figure 1. *Urban area of Lima with sites mentioned in the contribution. 1. Asentamiento Humano Colinas del Pacífico-hijos de Miyashiro, 2. Villa El Salvador, 3. Lomas de Lúcumo (Pachacámac), 4. Villa María del Triunfo, 5. Ciudad de Dios, 6. Lomas de Paraíso (Villa María), 7. El Paraíso (Villa María del Triunfo), 8. Distrito del Rímac, 9. Los Postes – Lomas El Mirador (Distrito Independencia), 10. PREVI (Distrito de Los Olivos), 11. Lomas de Primavera (Carabayllo), 12. San Juan de Lurigancho. Source: author's graphic elaboration based on data from INEI (2013) and Google Earth (2024).*

The primary objective of this paper is to reconsider informal settlements not merely as sites of deprivation or illegality, but as environments in which adaptive spatial strategies, collective practices and alternative housing models emerge under conditions of extreme constraint. While acknowledging the persistent challenges of poverty and insecurity, the study emphasises the importance of understanding the social and cultural logics that underpin self-built environments. In this sense, informal habitats are approached as both material and social processes, the analysis of which can inform more context-sensitive and inclusive planning approaches. Today, more than ever, such communities require not only financial investment but also technical, cultural, and human support. The growing involvement of public institutions, NGOs and citizen collectives in participatory projects for space-making, service provision and environmental management (UN-Habitat, 2016) indicates the relevance of integrating local knowledge and agency into future strategies for urban development.

State-of-the-art: Environmental changes and unsustainable urbanisation

The world is changing radically: in the age of the Anthropocene (Turpin, 2013; Marra et al., 2021), humans have become the main force driving the earth's changes, disrupting natural processes and rhythms. The permanent environmental upheaval caused by the direct and indirect actions of human beings and the consequent climate changes have led to a reduction or loss of habitable and cultivable territories. The reduction of habitable territory has triggered reactive processes of human survival.

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The most evident and difficult-to-govern effect is that of leaving one's land and embarking on a path of migration in search of more acceptable living conditions (UN-Habitat, 2023). Environmental pressures, combined with economic and political instability, have forced entire populations to migrate *en masse* from rural areas and seek refuge near urban centres; the latter inevitably continue to expand. This process is so extensive and accelerated that the 21st century will likely be remembered as the 'century of the cities', with rural populations having been overtaken by urban populations a percentage of the total in 2007 (NCSU, 2007).

Global population has further intensified these dynamics. According to United Nations estimates, the world population reached 8 billion in early 2023,[6] and is projected to approach 10 billion by 2100; with growth concentrated primarily in low-income countries. Currently, more than 57% of the global population resides in urban areas (Figure 2), compared to just 30 % in 1950. Given this trend, the global level of urbanisation is expected to reach almost 70 % by 2050 (UN-Ecosoc, 2018).

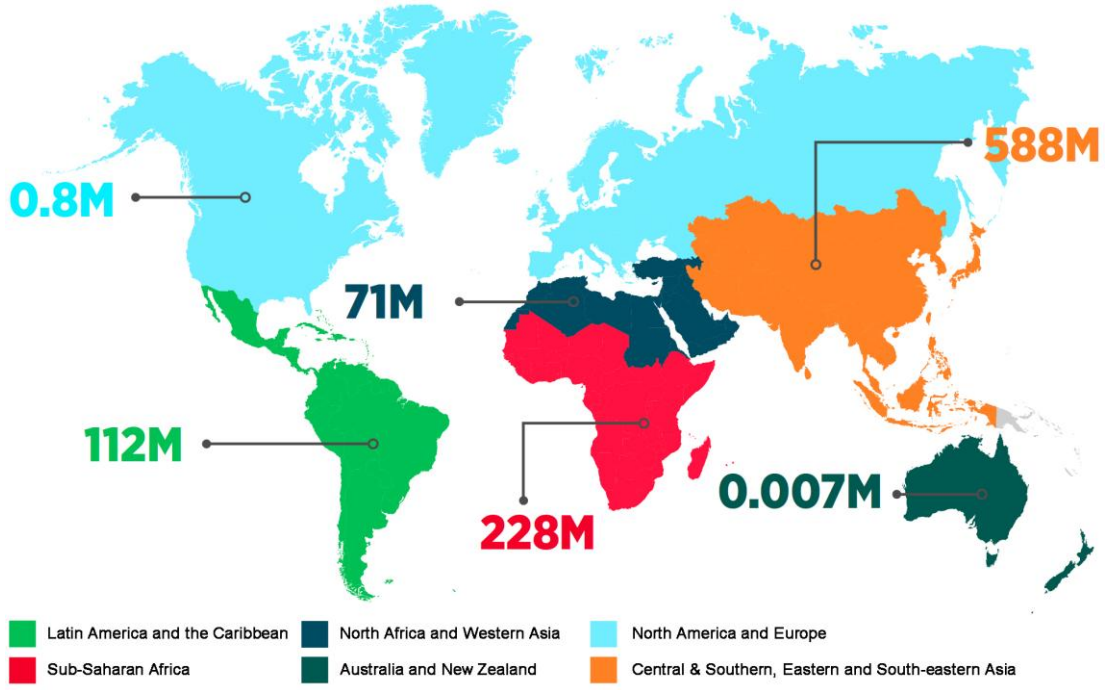

Figure 2. *Population, by region, living in slums and informal settlements, as estimated in 2016. Source: Global Urban Observatory (2019, p. 6)*

Another notable aspect of unsustainable urbanisation processes is that urban habitats are currently based on linear economy models. These models are founded on the use of natural resources and materials to produce goods, which are then used and disposed of at the end of their life cycles. This results in cities consuming over 75 % of the world's natural resources available globally, producing over 50 % of global waste, and emitting between 60 and 80 % of greenhouse gases. As emphasised by UN Secretary-General António Guterres, cities represent the primary arena in which the fight against climate change will be won or lost, and the success of the *2030 Agenda for Sustainable Development* depends largely on urban action (UN-ECLAC, 2006). These dynamics are particularly evident in rapidly urbanising regions of

[6] It took tens of thousands of years for the world population to surpass one billion (1804) but just over 120 years to reach two billion (1927) and only 12 years more, from seven billion (2011) to eight billion (2023) (UN DESA, 2023).

the Global South, where accelerated demographic growth and unequal development have intensified environmental and spatial pressures. In South America, and particularly in Peru, the urban population reached approximately 79.14% of the total population in 2024, marking a substantial increase from the much lower levels recorded in the 1960s. This trend reflects the country's rapid urbanisation and the growing environmental and resource pressures generated by urban expansion (The Global Economy, 2025).

While rural areas are losing their populations and experiencing consequential abandonment of land, cities and urbanised territories are unable to absorb the large and constant influx of people migrating towards them. The result of this is the global proliferation of the phenomenon of informal settlements, in which discarded communities of the current model of socio-ecological relations at a global level (such as migrants) find refuge. These people and their settlements are marginalised by society whilst also being extremely functional to capitalist production (Armiero, 2021).

Precarious settlements

Slums, *bidonvilles, favelas, barriadas, ciudades miserias*, new towns, shantytowns, and/or refugee camps —terms used to describe spontaneous settlements across different geographical contexts— are typically characterised by inadequate access to basic services and infrastructure, as well as high levels of population density and overcrowding[7] (Table 1).

Informality is often associated with phenomena that occur outside formal processes or regulated environments (Roy, 2005). It can include a wide range of situations, such as processes of spontaneous occupation of land, lack of title deeds, self-building of housing, illegal housing in contexts of rapid urbanisation, temporary uses of space, forms of self-organisation, and development of urban areas on the outskirts of the city, (Lutzoni, 2011). Informal habitats may organise parallel systems to the formal ones but rarely manage to be self-sufficient. More often than not, they need the formal ecosystem to survive and, paradoxically, eventually become functional to the whole system. Settlements such as Kibera, Dharavi, Neza-Chalco-Itza, Khayelitsha, Cité Soleil, Makoko, Rocinha, Agbogbloshie are the poorest appendages of some of the world's megacities.[8]

These contexts of insecure housing conditions are widely recognised as sites of multiple and intersecting vulnerabilities—social, economic, environmental, and health-related—which are increasingly exacerbated by the impacts of climate change. The enormous numbers of people residing in these places drive significant sub-urban informal economies, which, without waiting for transitions imposed from national/local authorities, are spontaneously and necessarily circular. All over the world, recovering, recycling, reusing, sharing, and transforming are a matter of survival (Marino, 2021).

[7] According to UN-Habitat (2018), informal settlements are residential areas characterised by: (1) lack of secure tenure, ranging from squatting to informal rental; (2) limited or absent access to basic services and formal infrastructure; and (3) dwellings that often do not comply with planning or building regulations and may be located in hazardous areas (UN-Habitat, 2018, p. 12).
[8] Major informal settlements include Kibera (Nairobi, ~2.5 million), Dharavi (Mumbai, ~1 million), Neza-Chalco-Itza (Mexico City, up to 4 million), Khayelitsha (Cape Town, ~1.2 million), Cité Soleil (Port-au-Prince, ~240,000), Makoko (Lagos, >100,000), Rocinha (Rio de Janeiro, ~70,000), and Agbogbloshie (Accra, >80,000) (Marino, 2021).

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Table 1. *Difference in socio-spatial structure between precarious settlements*

Type of settlement	Population density	Services and infrastructure	Socio-economic profile	Main spatial characteristics
Slums (Asia, Africa)	Very high	Very limited	Low-income population, often regional or rural-to-urban migrants	Improvised structures, narrow and irregular streets
Bidonvilles (Francophone Africa)	High	Limited	Low-income population, rural-to-urban migrants	Temporary housing, informal peripheral settlements
Favelas (Brazil)	Very high	Poor access to services	Low-income population	Spontaneous expansion on hills, irregular masonry buildings
Barriadas (Peru)	High	Limited but improving	Low-income population, rural-to-urban migrants	Weak planning, narrow streets, gradual development
Ciudades miserias (Argentina)	High	Very limited	Low-income population	Precarious structures, unregulated growth
New towns (various regions)	Medium	Basic services available	Migrants and refugees	Minimal planning, rapid construction
Shantytowns (Africa, India)	Very high	Absent or very poor services	Low-income population, often regional or rural-to-urban migrants	Temporary structures, high density
Refugee camps	Variable	Humanitarian services available but limited	Refugees	Tents or containers, provisional planning, common areas

Compared to official governmental cartographies, informal habitats constitute an 'invisible' landscape, which do not seek stability and order as their goal, but rather adaptation to everyday life (Corner, 2000, p. 151). While informal habitats are difficult to define and regulate, they are also places of experimentation and solidarity[9] in which, by necessity, aspects of the circular economy are practiced. Indeed, these settlements can be interpreted as regenerative urban systems, in which principles of the circular economy are operationalised across multiple spatial and functional dimensions, following the definition of the Ellen MacArthur Foundation[10]. This model of living through the valorisation of human capital and the systematic reuse of what has already been discarded leads to the elimination and reduction of waste, or to a reinterpretation of the concept of refuse (Ellen MacArthur Foundation, 2019; Ghisellini et al., 2016).

[9] Gentrification and displacement are ongoing urban processes worldwide and increasingly affect informal areas such as Rio's *favelas* or Lima's *barriadas*, and often undermine existent systems of social solidarity and mutual aid that sustain local socio-economic balances (Harvey, 2013, p. 40).

[10] "The circular economy is a system in which materials never become waste and nature is regenerated. In a circular economy, products and materials are kept in circulation through processes such as maintenance, reuse, refurbishment, remanufacture, recycling, and composting. The circular economy tackles climate change and other global challenges, including: biodiversity loss, waste, and pollution, by decoupling economic activity from the consumption of finite resources". (Ellen MacArthur Foundation, 2019)

Although informal settlements exist worldwide, they are most visible in cities of the Global South, where they absorb large-scale regional and transnational migration flows. As highlighted by Nezar Alsayyad (2004) in *Urban Informality as a 'New' Way of Life*, the urban future does not reside in large western cities, but in the informal megacities of Central and South America, Asia and Africa.

However, rather than framing informality solely as a 'new model' of urbanisation, it is crucial to consider it in light of global demographic trends. Population growth in Africa, India, China, and South America far exceeds that of the Western world, making informality proportionally more significant when measured against the size of the individual nations/regions' urban population[11]. This comparison highlights the importance of reference scenarios: the absolute significance of informality varies dramatically depending on the special urban scale and demographic context under consideration (UN DESA, 2025).

Importantly, these settlements are not merely statistical phenomena. They host innovative social, economic, and environmental practices that, while often emerging out of necessity can also inform urban policies, particularly in the context of the 'right to the city' (Harvey, 2008). Observing how communities negotiate space, access services, and create informal infrastructures provides valuable insights for planners, policymakers, and scholars seeking to integrate flexibility, resilience, and inclusivity into urban design and governance (Roy, 2005; UN-Habitat, 2020).

Informal spatial construction in the context of South America and Lima

South America and the Caribbean were the first regions of the developing world to go through an intense process of urban growth. Today, eight out of ten people in the two regions live in cities (UN-Habitat, 2012; World Bank, 2020). Urbanisation in South America has largely been generated by the occupation of land by small social groups through direct alteration of space. There is a specific relationship between the social unit occupying a piece of land in a territory and the area around it; each unit is an active promoter of the process and at the same time part of a collective in which social networks are quite cohesive (Turner, 1968; Riofrío, 1991).

Within the South American context, the case of Peru is significant because, from the beginning of 20th century, the country has undergone rapid population growth and suburbanisation processes connected to illegal settlement development. Since the 1940s, massive migrations to the country's coastal cities have been recorded (Driant, 1991; Gyger, 2013), with particulary high concentrations directed towards the metropolitan area of Lima. During this period, the emergence of informal urban forms became increasingly visible. The *tugurios*, or shacks, spread throughout the city centre, while *barriadas*, or informal settlements, occupied the desert periphery. Consequently, between 1940 and 1972 Lima grew from approximately 660,000 inhabitants to 3,420,000, i.e. its population increased by 500 %.[12] In the following decades, the expansion of informal and self-built urbanisation continued beyond formal planning frameworks. Today, informal and self-constructed areas in the metropolitan region of Lima and Callao are estimated to account for a substantial proportion of the urban fabric, often reported as between 60 and 70% of the metropolitan area.

[11] Makoko houses approximately 300,000 residents within a metropolitan population of 21 million, about 1.43 % (Pulitzer Center, 2021), whereas Cañada Real near Madrid hosts around 8,000 residents within a metropolitan population of 3.3 million, 0.24 %, (Ruiz-Rivas et al., 2022); these figures highlight the differing relative impacts within formal urban systems.

[12] Peru's civil conflict, which began in the 1980s, displaced nearly one-third of the population affected by violence between *Sendero Luminoso* and government forces, driving migration towards Lima and other major cities (Ceccoli, 1999).

Over the years, the consolidation of this type of settlement has transformed them from temporary to stable and given rise to the urban model of *barriadas*, i.e. precarious agglomerations lacking essential services, which have become the most widespread form of urban growth in Lima (CRP, 1996). Further new areas of spontaneous settlement are called *pueblos jóvenes*, these began as temporary settlements in which there is almost no infrastructure, and water is a scarce and expensive resource.[13] Today, the words *barriadas* and *pueblos jóvenes* have taken on a strong negative and discriminatory connotation. As a result, these urban habitats are now generically called *Asentamientos Humanos*, the term by which they are referred to in this paper.

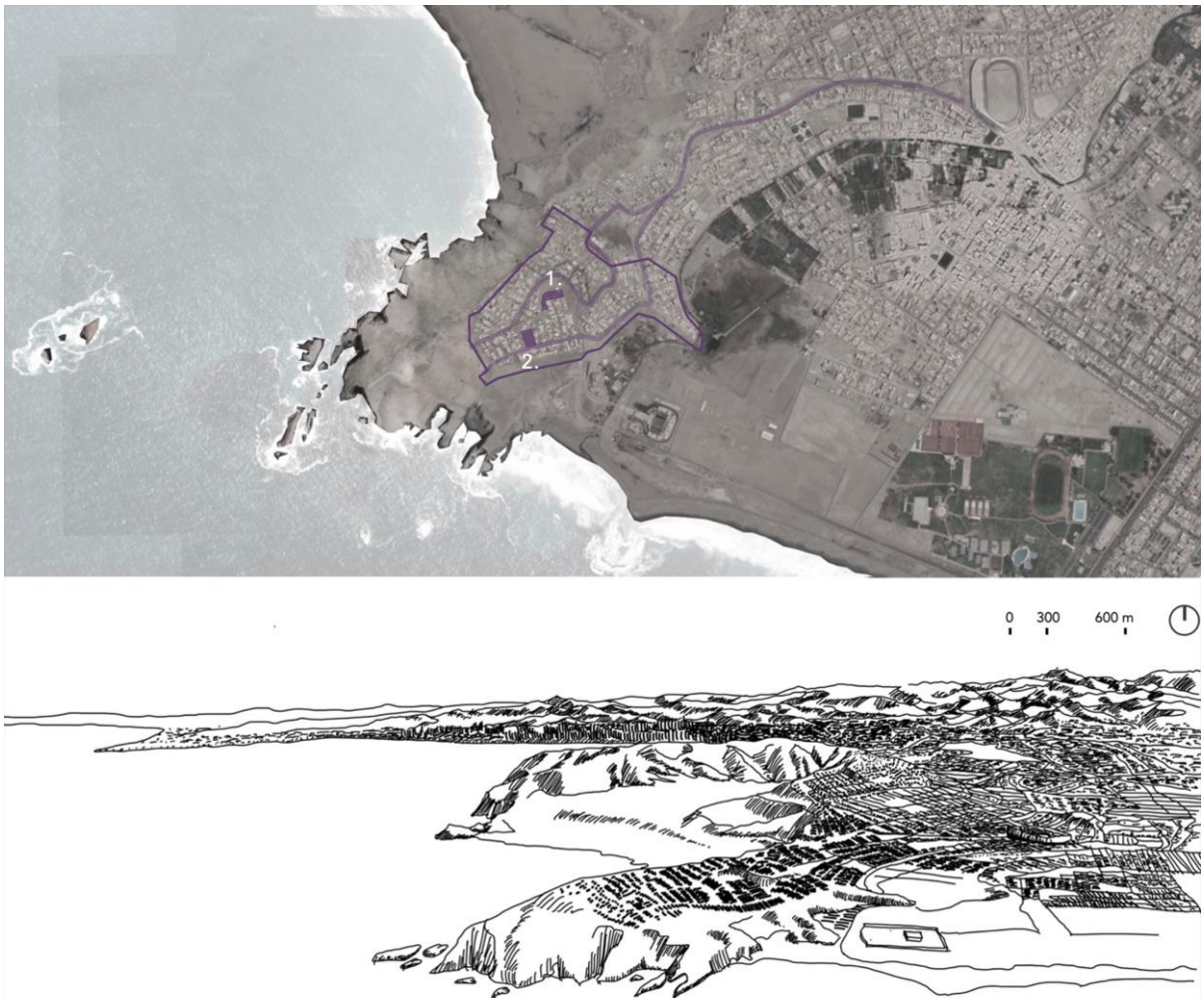

***Figure 3**. Asentamiento Humano Colina del Pacifico-hijos de Miyashiro, 3,600 inhabitants. The aggregation areas (1. Sports area, 2. Square) and main access roads are recognised. Source: Google Earth and author's elaboration, 2025*

A particularly illustrative example of this settlement in terms of geography, morphology, and social dynamics is the *pueblo jóven* Colinas del Pacífico; part of the Chorrillos district south of Lima and close to the Chira River (Figure 3). It occupies the hill above the *Urbanización de* San Genaro and is the extension toward the coast of other older *Asentamientos Humanos*, i.e., Nueva Caledonia and Hijos de Miyashiro. Rising without any planning, this *Asentamiento*

[13] Water supply in Lima is such a widespread problem that more than two of its ten million inhabitants have difficulty accessing drinking water and live without a sewage system; bringing serious sanitation deficiencies. Such persons are exposed to disease risks and the abuse of paying ten times more for water than the service provided by *Servicio de Agua Potable y Alcantarillado de Lima* (SEDAPAL, 2020; World Bank, 2016).

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Humano is one of the most recent settlements (only recognised as permanent in 1994) and is still in evolution. In recent years, it has continued to grow and encroach on the neighbouring desert lands, while pushing further and further towards the coastline.[14] It is located on a friable terrain with steep slopes (slopes from 10 to 70 meters above sea level); the area is unsuitable for urbanisation, with neither structure for land distribution, nor any discerning selection of lands to occupy. As there are no defined boundaries today, the cluster of these settlements is called *Asentamiento Humano* Colinas del Pacífico-hijos de Miyashiro (Figure 4). In general, the city continues to grow rapidly and, despite attempts to manage migration flows from rural areas to the city, an average of 150,000 new inhabitants a year settle in areas of low economic value or on the outskirts of Lima.

Figure 4. *Above: view of the Asentamiento Humano Colina del Pacifico-hijos de Miyashiro. Below: Asentameniento Humano within the Chorrillos district and plan sketch. Source: author's elaboration, 2024*

Adding to the precariousness of the overall picture in Lima, it is the second largest city in the world, and is located in a desert, where water is scarce. Situated between the Pacific Ocean and the Andes, it has annual precipitation less than 4 centimetres and presents much colder and wetter climate than its sub-tropical latitude (Pulgar-Vidal, 1996). Yet for nine months of the year, it is buried under a sea fog that rises when cold wind currents meet warm ones; humidity reaches 98 %, generating the phenomenon called *garúa,*[15] To further worsen the

[14] The *Asociación Civil Asentamiento Humano Permanente Pacifico de Villa*, Chorrillos, in 1993 took possession of unoccupied state-owned land for housing purposes. This land, located at the southwestern end of Cerro La Chira, had been peacefully and continuously occupied for 20 years. Subsequently, the Municipality of Chorrillos officially recognized Pacífico de Villa as a *Permanent Human Settlement* (Municipalidad de Chorrillos, 1994).
[15] *Garúa* is a persistent coastal fog characteristic of Lima that is produced by the interaction between the Humboldt Current and warm ocean air. Although it yields minimal rainfall, it generates high humidity and plays a

critical environmental balance, climate change has affected the quality and quantity of natural resources, exacerbating the territory's vulnerability to atmospheric events. As a result, the waters of the Rímac, Chillón, and Lurín rivers, which guarantee Lima's water supply, have decreased by 12 % in recent years (SEDAPAL, 2020; Vuille et al., 2018).

Water insecurity poses a critical threat to urban safety and habitability. *Asentamientos Humanos*, especially the newer ones, often lack services and infrastructure such as public and domestic lighting, urban paving, recreational and community facilities, sewage systems, rainwater drainage, and drinking water supplies. With specific regards to the site of *Asentamiento Humano* Colinas del Pacífico-hijos de Miyashiro, drinking water sources are completely absent as the nearby Chira River is polluted and so water is periodically supplied by tanker trucks, at very high prices[16] (Figure 5).

***Figure 5**. Water is distributed by tanker trucks, which periodically fill the cisterns, placed on the main road near the houses. Photo and sketches by the author, 2018*

Process of formation of *Asentamientos Humanos*

In the formal city, as described by the architect Manuel de Solà-Morales (1997), the processes of urbanisation-localisation-construction-settlement are linear and top-down (from urban

key role in shaping local microclimates and ecosystems (Pulgar-Vidal, 1996).

[16] In response to chronic water scarcity, Lima has promoted desalination plants and expanded networks through public-private partnerships. However, access remains uneven, and many informal settlements (such as Colinas del Pacífico) continue to rely on costly tanker-truck deliveries (Ministerio de Vivienda, 2022; World Bank, 2016).

space to houses). As a result, the inhabitants are users of an already defined medium.[17] In contrast, the process of *Asentamientos Humanos* formation occurs from the bottom-up (from houses to the urban space). The perception of homes is not simply as objects but the materialisation of social processes which develop incrementally. Many of the stages of the process are simultaneous: first the land is divided, then Urbanisation and construction take place concurrently (de Solà-Morales i Rubió, 1997). While not following the typical patterns of conventional urbanism, the creation of these *Asentamientos Humanos* present recurring characteristics: organic street layouts that respond to topography rather than formal grids; incremental housing expansion, often resulting in irregular plots and varied building heights; mixed-use spaces, where residential, commercial, and social activities coexist; and semi-public or communal areas interwoven with private dwellings - reflecting the flexible use of space.

The permanent state of incompleteness allows the incorporation of spaces for semi-public or completely public use in the process of formation of private spaces; thereby endowing the *Asentamientos Humanos* with public services. It is during this process of consolidation that social, commercial, and urban relationships appear that, like the fabric of which they are part, change, mutate, and evolve.

Specifically, cases such as Colinas del Pacífico–Hijos de Miyashiro illustrate how informal settlements are defined over time and enable social and temporal variables to interact in a kind of symbiosis with physical space. In a bottom-up system, there is a land allocation process followed by the construction of housing, infrastructure, embankments, and the definition of spatial uses. These are simultaneous processes that influence each other. Uses are localised according to the needs of the inhabitants, and the construction of houses generates forms of interaction with the surrounding space; shaping it. Since the process does not proceed linearly but moves from large to small scale, it enables continuous interactions to occur between the different stages.

Housing as an aggregation unit of the *Asentamientos Humanos*

The process of creating a new dwelling in an *Asentamiento Humano* begins with settling in a location, occupying the space, and establishing an enclosure. A precarious housing unit is built by putting down a mat[18], which delimits a portion of the desert. Slowly, makeshift materials are accumulated to construct a roof and the different rooms. Then, depending on the household's economic availability, temporary structures are replaced with more stable ones (Figure 6). Thus, the development of housing and the process of its consolidation depends directly on the growth of the household. This means that housing is shaped by parameters unrelated to the conventional process of urbanisation[19] (Turner, 1968; Driant, 1991; Riofrío, 1991).

[17] This sequential planning process limits mutual interaction between phases: zoning and functions are predefined, spaces are assigned fixed uses, and change requires spatial redefinition, prioritising functional programming over spatial qualities (de Solà-Morales i Rubió, 1997).
[18] Previously, mats made from woven plant materials were commonly used. Nowadays, plastic sheeting and various objects that can serve as fencing, such as pallets or petrol cans, are frequently employed.
[19] Initial occupations are often managed by local committees that allocate plots and mediate conflicts. Land rights emerge as social claims grounded in collective recognition rather than formal legality. Formalisation is gradual, selective, and often incomplete, producing a prolonged condition of negotiated uncertainty that remains integral to spatial production (Turner, 1976; Fernandes, 2011).

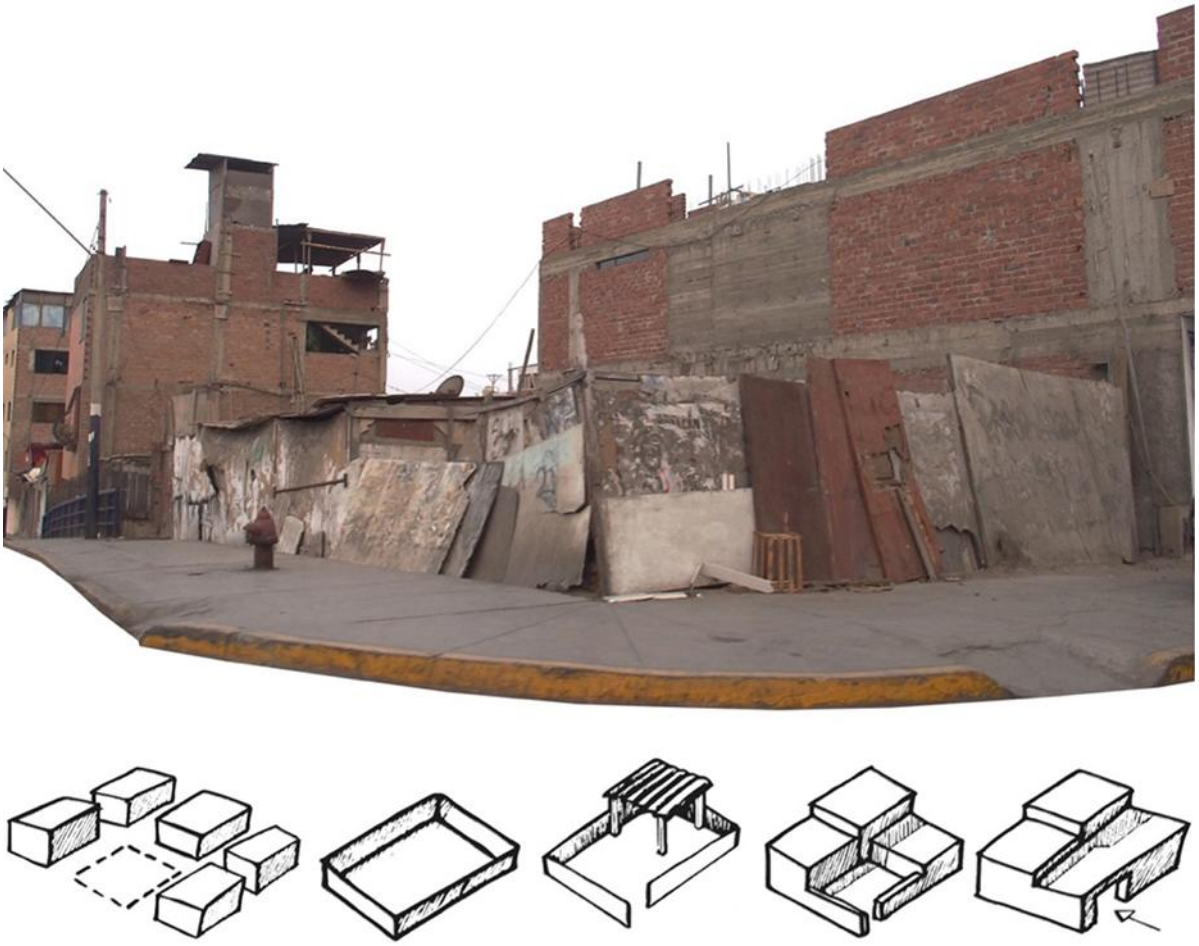

***Figure 6**. The space is occupied, first by fencing off the area and accumulating material that will be used to build the domestic space. Photo and sketches by the author, 2018*

As the dwelling stabilises, it may be subdivided and no longer remain under single ownership, initiating a transition from single-family to multi-household occupation. Depending on land morphology and surrounding density, this can lead to the construction of low-rise multi-story buildings, typically no more than three floors. In this context, inhabitants are not passive users of a finished product but active builders and transformers of their environment (Figure 7).

Over time, the dwelling evolves and begins to function as the aggregation unit of the informal city. The transformation starts from inside the house but expands by generating the urban space and its texture, so that private, semi-public, and public spaces evolve together and are closely linked to the transformations of the (given) house. Along street fronts, one or more rooms are frequently converted into commercial spaces, echoing processes similar to the 'tabernization' of Roman *insulae*[20]. These are specialised rooms for commercial use which are used by the family, and over time tend to become autonomous.

[20] Roman *insulae* were multi-storey residential buildings in ancient Rome. 'Tabernization' describes the gradual conversion of ground-floor rooms into *tabernae*, street-facing commercial units that often became economically independent from the dwelling over time.

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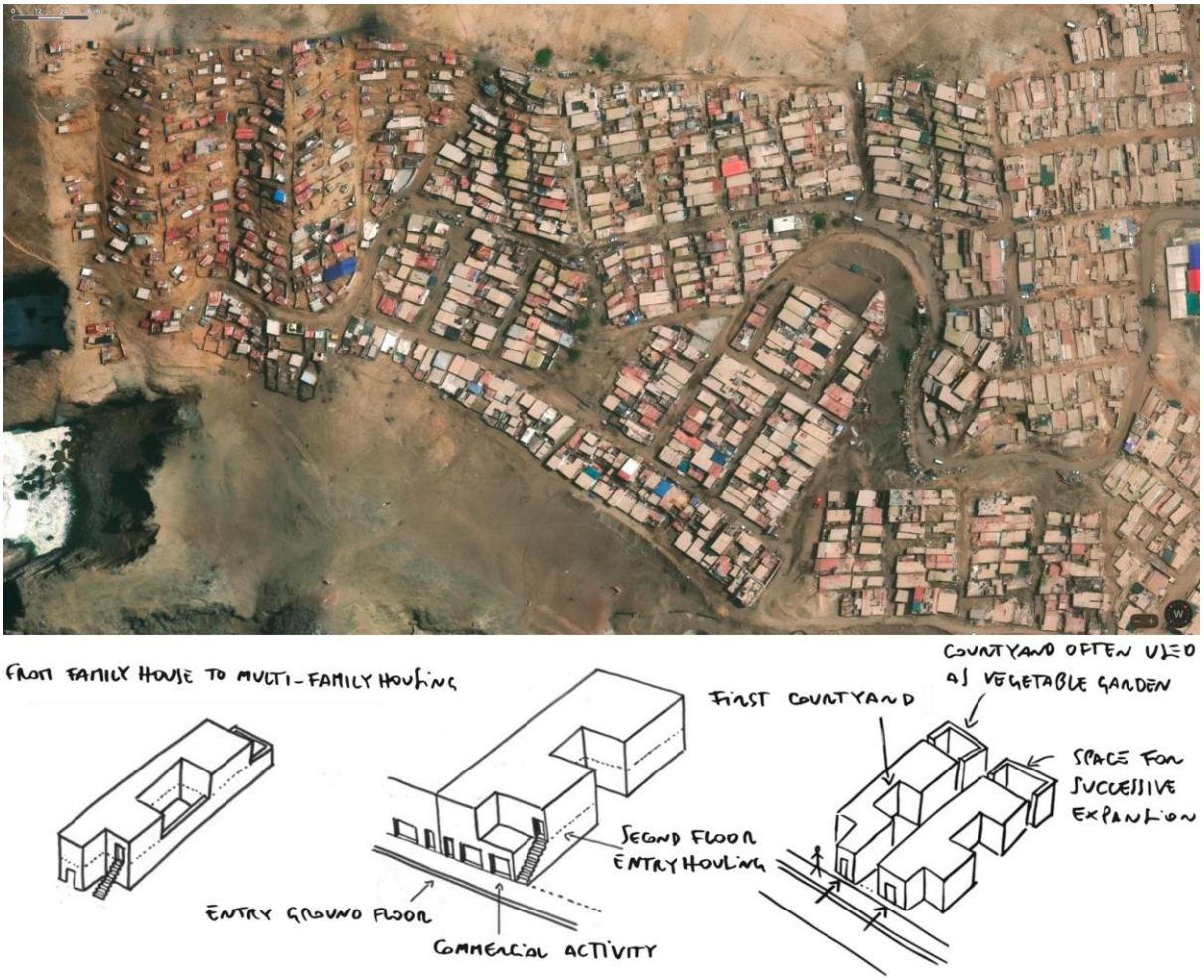

***Figure 7**. Above: Asentamiento Humano Colinas del Pacífico-hijos de Miyashiro; near the coastline the last settlements can be recognised. Below: a diagram of the formation process of a housing unit. Source: Google Earth and author's elaboration, 2018*

In addition, buildings created by private initiatives to be used as living quarters can become supply points for basic services that compensate for the shortage or absence of external or planned community services. These clusters of buildings are shaped according to a low-rise and high-density structure, and are coherent with the organic development of the settlement. There are uncertain borders between private and public spaces, and they are characterised by operations of transfer and appropriation (Sáez Giráldez, 2015). It follows, in such instances, that a living room may, for example, be used as a library, or that a room open to a courtyard might become a nursery, open to local creative invention. In short, they are spaces capable of adapting to specific uses of community need, while also being able to be re-incorporated into the housing regime.

This phenomenon allows the population to identify with the spaces of the *Asentamiento Humano*. For example, the street is not only a traffic route but also a place of aggregation and community life, as a result of the existence of intermediate spaces between private and public spaces. The continuous adaptation of the built environment supports the coexistence of multiple functions in close proximity; often overlapping living, working, and social activities. While not implying direct causality, this pattern is characteristic of incremental, self-built settlements and has implications for mobility, transport, and connectivity: including the

widespread use of informal transport systems such as *colectivos* and *combis*.[21] Urban space is thus produced simultaneously at the micro-scale of housing and commerce and at the macro-scale of infrastructure such as schools, hospitals, and larger green areas. Despite frequent articulation challenges, these systems coexist and interact.

In the case of the *Asentamiento Humano* Colinas del Pacífico-hijos de Miyashiro, the density of housing has inevitably conditioned the use of the common areas for activities such as commerce. In addition, the rugged morphological conformation, with its great differences in height, has contributed to spatial organisation. In the central part of the *Asentamiento Humano* Colinas del Pacífico-hijos de Miyashiro, which has a steep drop in altitude, the community's water supply system was installed. Since there is no running water here, each family has its own tanks; filled by tanker trucks that are stationed on the highest part of the land so that gravity can be used to distribute the water. Immediately below, the space has been kept free by the community, and sports and recreational areas have been created; these also serve as community meeting spaces (MDC, 2024) (Figure 8).

***Figure 8**. Central areas of the Asentamiento Humano Colinas del Pacífico-hijos de Miyashiro. Overview photo (1. Cisterns, 2. Sports area, 3. Chapel). Near the chapel is a transit area, street traders often stop selling their wares. Photos by the author, 2018*

These processes are supported not only by the public administration but also by NGOs and religious bodies, such as the Comboni Missionaries (MCCJ), that seek to support some spontaneous positive practices.[22] The Comboni Missionaries have, for example, have built a chapel with recycled material immediately next to the sports-recreational area. It is another gathering place and, as a consequence of it being a place of passage and meeting, very often street vendors stop by with their mobile shops to sell their products. Another example is the public canteens, which were set up in the *Asentamiento Humano* during the Covid-19 pandemic crisis, which severely affected the *Asentamientos Humanos* of Peru. They are run by the local population, particularly women, who take it in turns to cook.[23]

[21] These are unofficial carpooling systems. *Colectivos* operate as informal shared taxis for longer routes (e.g. to go from Lima to Chosica), while *combis* are small minibuses running fixed routes with informal stops, offering low-cost mobility alternatives.
[22] MCCJ is an international Catholic missionary institute founded in 1867. It has been present in Lima since 1938 and in the Chorrillos district since 1970. The organisation collaborates with various professionals, such as psychologists and social workers, as well as doctors and nurses. It is organisation committed to environmental care and human promotion.
[23] Among the various *Asentamientos Humanos* in Chorrillos district, seven canteens were set up by the MCCJs to ensure the provision hot meals for as many people as possible.

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Building materials: reuse, frugality, and socio-spatial adaptation

In the *Asentamientos Humanos*, spaces are shaped both by the incremental occupation of land and by the collective practices of residents, who adapt and organise the built environment according to social and material needs. Streets, courtyards, and intermediate spaces emerge as flexible nodes that structure everyday life; thereby mediating between private and public uses. Within this framework, building materials play practical and symbolic roles: accessible and low-cost materials, both new and reused, allow households to meet immediate functional needs while supporting the gradual consolidation of dwellings. Material choices not only follow principles of economy and availability but also reflect a broader culture of frugality; evident in both the area's precarious living arrangements and more stable constructions. In this context, what is built responds primarily to the bare necessities of life (Mosco, 2022).

The materials used are produced by the construction industry: from trapezoidal sheet steel which is used to make roofs, to hollow bricks and associated products that are used to construct walls, and the concrete from which structural parts are made. In addition to the 'new' materials, there is a whole series of reused materials. Metals, wood, and other construction waste are frequently repurposed through upcycling; extending their life and providing functional solutions for foundations, walls, and structural elements (Figure 9) (Ghisellini et al., 2016; Marino, 2021; Cossu & Williams, 2015).

***Figure 9**. Urban mining and reuse of objects and materials is an observable part of the construction of houses. Photo and graphic elaboration by the author, 2018*

These practices often take the form of *urban mining*, whereby usable resources are extracted from waste streams and reintroduced into the construction process to produce building components and goods directly serving residents' needs (Cossu & Williams, 2015; Krook & Baas, 2013). For instance, truck tyres filled with sand and stones are transformed into stable foundations, while wooden pallets are adapted into self-supporting wall structures. Commonly observed in self-constructed settlements, such practices align with circular economy principles by emphasising resource efficiency and waste valorisation (Krook & Baas, 2013; Musco et al., 2020; Arora et al., 2021).

Evidence from informal settlement case studies shows that the reuse of locally available waste materials contributes to more sustainable building practices at the neighbourhood scale (Dey & Iulo, 2021). Importantly, these material strategies emerge organically from the socio-spatial dynamics of the settlement rather than from formal architectural design, and thus illustrate how self-built housing adapts to constraints of cost, material availability, and incremental growth.

Examining materials and construction practices in this way highlights how they can complement socio-spatial analyses and offer insights into how residents negotiate space, resources, and functionality in rapidly evolving urban contexts. The frugal dimension, widely recognised in the *Asentamientos Humanos*, is consistent with the observations of the Chilean architect Alejandro Aravena, who noted that resource scarcity, reduced budgets, and tight deadlines are major factors shaping contemporary architectural production (Mardones Hinche, 2007). If one considers the amount of waste which is produced every day, it is possible to understand how important it has become for materials to guarantee a degree of sustainability in any future intervention. Upcycling can and should increasingly become part of the architectural production process, not only for small or medium-sized objects but also entire buildings, and can therefore offer fruitful opportunities for experimentation (Musco et al., 2020; Arora et al., 2021).

Participatory processes and historical-disciplinary references: from *unidades vecinales* to PREVI

Over time, the *Asentamientos Humanos* of Lima have become places of experimentation for public institutions, professional practices, and NGOs. Their research and interventions have contributed to the development of new strategies aimed at improving infrastructure and living conditions within these informal settlements, while also generating transferable approaches that may inform similar contexts elsewhere.

The social housing programs began in the 1930s with the construction of workers' quarters and the professionalization of architects through the establishment of the Society of Architects. In 1945, architect Fernando Belaúde Terry[24] (cofounder of the National Democratic Front party) proposed the development of Lima's housing plan, based on the idea of *unidades vecinales* (neighbourhood units). The housing plan aimed to eradicate slums, rebuild urban blocks, and then resettle the populations in the new agglomerations. This is why in 1946, the *Corporación National de Vivienda* (CNV) was established and charged with planning, designing, and building social housing throughout Peru (Gyger, 2013; Driant, 1991).

However, from the 1950s onwards, and despite the completion of numerous neighbourhood units and housing complexes, the emergence of squatter settlements has intensified. It was

[24] Fernando Belaúnde Terry (1912–2002), architect and politician, proposed Lima's *Plan de Vivienda* based on neighbourhood units to replace slums with planned housing complexes. In 1946, the CNV was established to design and construct social housing throughout Peru. The first realised neighbourhood unit was *Unidad Vecinal N.º 3* in the Cercado de Lima, which was conceived as a residential complex with integrated services for the working class (Huapaya Espinoza, 2014; Abanto Sánchez, 2023).

clear that an effective response would not be possible in any case, as the time needed to complete neighbourhood units was too long and the number of dwellings too low compared to the housing shortage (Turner, 1968; Ward, 2012). Given this, CNV architects began to develop new strategies to overcome the shortage of housing whilst also working towards effective urbanisation for large numbers. During the same years, roughly between the mid-1950s and the early 1970s, of great geopolitical and cultural changes at a global level, similar reflections were carried out within the debates of the CIAM, such as the idea of 'Habitat for large Numbers' and the studies on the *bidonvilles* of Casablanca and Algiers. The change in sensibility was an anthropological reasoning[25] which became an embedded part of the reflections of young architects all over the world. In search of new methods of self-construction and community structuring (e.g. the redistribution of plots), they began to consider the *barriadas*, which had by then become densely populated neighbourhoods, no longer as an urban cancer, but as a potential Urbanisation model to be studied (Turner, 1976; Hamdi, 2004).

Between 1955 and 1961, the population of the *barriadas* increased from 10 to 17 %, and it became increasingly evident that the government would be able neither to tackle the problem nor respond to the needs of the people using traditional means of suburban growth. Through the enactment of law 135167, namely the *Ley de barriadas* (Law on Informal Settlements) the legalization of informal settlements around Lima was approved and their name was changed to "marginal neighbourhoods"; thereby formally integrating them into the city's administrative borders (Driant, 1991).

In 1956, a group of advisors, known as the *Commision de la reforma agraria y vivienda* (CRAV; 1956–1958), was set up by the Peruvian government to identify problems and solutions. The Commission headed by architect Adolfo Cordova, and assisted by architect Eduardo Neira and anthropologist José Matos Mar. Their initial idea was that the *barriadas* could be considered a realistic and effective model for urban development. They came up with the idea that building interventions, to be effective, should follow the criterion of "site and service development", i.e. the construction of minimal housing units with essential services such as electricity, water, and common areas, and that future interventions should follow this criterion as an optimal solution, given the absence of government funds. This expandable unit was called *vivienda elementar*, elementary house. Each unit was initially built by the government and then gradually completed by the owners with the help of technical assistance. This laid the foundations for the theories of *incremental architecture* (Driant, 1991; Ward, 2012).

The anthropologist Matos Mar (1966) then pushed the idea that the *barriadas* should be integrated into the city with more infrastructure because, though they were built in marginal areas, they were nonetheless functional to the city and an integral part of its economic structure through accommodating not only labour but also marginal economic activities. One of the first places studied was the Ciudad de Dios.

In 1963, Fernando Belaúnde Terry was elected president of Peru. While initially promoting medium- and high-density social housing, he soon acknowledged that the "fruits" of these policies could not keep pace with the rapid formation of new *barriadas*. This realisation led to the conception of a project aligned with the logic of informal settlements: housing capable of progressive growth on low- and high-density plots and produced through modern industrialised

[25] In 1955, anthropologist Claude Lévi-Strauss published *Tristes Tropiques*, which, together with *Race et histoire* (1952) and *La Pensée sauvage* (1962), challenged the idea of the superiority of Western culture. By defining culture as a symbolic system, Lévi-Strauss argued that so-called "primitive" societies possess their own forms of logic and value. Structuralism thus marked a turning point in anthropology and influenced wider cultural debates in the twentieth century. These ideas also informed the work of many young architects. In particular, CIAM 9 (1953) emphasised an anthropological approach to housing, inspired by figures such as Aldo van Eyck and the Smithsons, who focused on identity, everyday life, and the relationship between housing and local culture.

methods. In collaboration with government officials and with the support of the architect Peter Land, the organisational structure of the project was further developed. In 1966, the proposal was officially presented to the United Nations Development Programme (UNDP), which recognised its prototypical character and the potential applicability of its results to other global contexts. As a result, the UNDP decided to sponsor the initiative (de Rivero et al., 2004).

The result was the PREVI competition (*PRoyecto Experimental de VIvienda*), which was promoted by the Peruvian government and sponsored by the UNDP. PREVI brought together international and Peruvian architects to address migrant housing needs by integrating principles of industrialization and standardization into self-built housing models[26] (Kahatt, 2012). The project proposed a collective housing model inspired by *unidades vecinales*, which was designed to encourage social interaction, resident-led transformation, and the appropriation of public spaces; thereby fostering equality and participation (Figure 10).

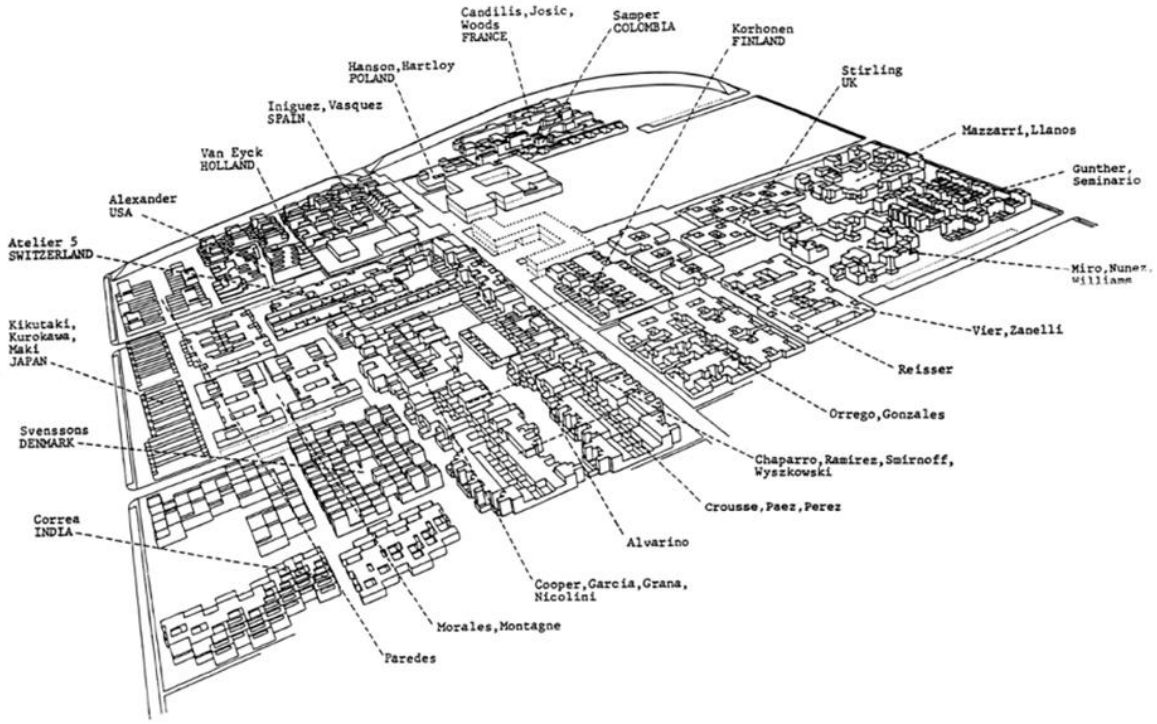

***Figure 10**. Architect Peter Land, 1968. PREVI/Peru, The Experimental Housing Project, Lima. Design & Technology in the New Neighbourhood. Drawing of the completed project with architects' names. Source: Land (1994)*

A central theoretical contribution to these debates was provided by John F. C. Turner, who collaborated with CNV and CRAV architects, and was supported by the anthropologist William Mangin working with the U.S. Agency for International Development (USAID). Turner argued that *barriadas* embodied fundamental freedoms: the freedom to choose one's community, allocate resources, and shape one's environment (Turner, 1968). In *Housing by People*, he

[26] The competition started in March 1969 and involved 13 international teams from different countries. Because the project was experimental, the jury decided to develop all 26 proposals, both international and Peruvian, to explore a wide range of ideas. Peter Land and the multidisciplinary development group combined the best solutions into a single urban plan made up of housing clusters. A research laboratory in Lima coordinated the project until 1974, when the first phase of 500 houses was built. After a military coup that overthrew the Belaunde government, the PREVI Development Group office was closed, and it took two more years for the houses to be occupied (Kahatt, 2012).

emphasised participation as the core of housing processes and advocated minimal intervention by authorities except in cases of necessity (Turner, 1976). Participation thus emerged as a crucial link between users, social objectives, and architectural production. These reflections, shaped by rapid demographic growth, profoundly influenced generations of architects, and continue to inform contemporary practices.

In Lima, this legacy is still evident in ongoing land regularization policies, with approximately 1.5 million plots currently registered (Fernandes, 2011; Arribas, 2024). State support in land selection and subdivision fostered strong community identity and encouraged residents to invest labor and resources with the expectation of future tenure security. These interventions led to structured social assistance programs, improved land selection criteria, and greater integration of informal neighbourhoods into the urban fabric. As a result, and over several decades, neighbourhoods have, especially when compared to other examples in South America, shown remarkable integration into the city.

Construction of communal spaces today: from participatory processes to support for spontaneous activities.

Self-building and participation are key terms in the development context of *Asentamientos Humanos*. The involvement of local population, as defined by Yona Friedman (2009) in *The Architecture of Survival* permits the integration of the roles of inhabitants and architects in the configuration and realization of architectural and urban spaces.

Contemporary initiatives addressing housing needs and communal spaces increasingly prioritize public areas and social services as instruments for reactivating urban citizenship and improving collective well-being. At the same time, it is essential to acknowledge the limits of informal and unplanned strategies in addressing broader macro-economic, social, and climatic challenges. While collective decision-making and self-construction constitute important adaptive resources, they operate within persistent structural inequalities and institutional constraints. Frugal practices, often driven by necessity, should therefore be understood not as universal solutions but as context-specific responses that complement, rather than replace, formal planning, policy frameworks, and long-term infrastructural investment.

Within this context, community-based work in Lima has generated diverse spaces, services, and micro-interventions; ranging from façade improvements and urban agriculture to shared social facilities which have privileged adaptive processes over predefined formal outcomes. This approach aligns with Umberto Eco's (1962) concept of the *open-work*[27], here employed as an operational framework rather than a purely theoretical construct. Informal settlements, characterised by uncertainty and incremental growth, enable flexible spatial configurations that accommodate future transformations driven by residents' needs and resources. Consequently, inhabitants' interventions are understood as integral to the (given) project's logic: the absence of a fixed final form does not imply disorder, but rather the presence of a minimal spatial structure capable of supporting gradual modification and reconstruction. Architecture is thus conceived as an open-ended process, in which the built form emerges through continuous participation and evolving social relations.

This logic is exemplified by the *Barrio Mío Program* (2012–2014), which was promoted by Lima's Municipality through the Public Spaces Recovery Service (REP), and provided technical assistance to hillside *Asentamientos Humanos* communities to improve public

[27] Umberto Eco defined the concept of open-work in 1962 as a form of cultural production with which user participation is indispensable for the culmination of the work. According to Eco (1962), works that present the concept of open-work are characterised by an invitation to complete the work with the author.

spaces within an integrated urban system (Espinoza Salas, 2022). Acting as a participatory platform, REP coordinated municipalities, residents, community organisations, universities, and volunteers around shared, low-cost visions; benefiting approximately 13,000 people through eight public space rehabilitation processes. A notable example is the *Sr. de los Milagros – La Ensenada* project, in Puente Piedra (2015), which exemplified this approach by reconnecting fragmented open spaces through pedestrian networks that enhance walkability and landscape value (Franco, 2015). A central park, co-designed with residents of different ages and professions, was transformed into a multifunctional community space completed within five months and now functions as a neighbourhood focal point[28].

Complementary initiatives further demonstrate how participatory and frugal strategies can operate across scales. The program *Valora Nuestro Barrio*, or Value Our Neighbourhood, presented in April 2022 by the *Colegio de Arquitectos de Perú, Regional Lima*, (CAP RL), identified 21 projects across Lima and Callao[29]. The initiative promotes best practices in public space design, environmental management, productive activities, services, heritage, and ecology through professional support, digital platforms, and material donations (Masalías, 2022). Among these, projects by the association *Has Tu Mundo Verde*, such as *Plaza Santa María, lugar para la infancia como lazo social*, focused on play as a social bond, and *Ruta Integradora Los Postes – Lomas El Mirador*, improved accessibility between the city and the hills; highlighting the role of co-design in social inclusion.

Other initiatives include the *Barrios que Cuidan* project, implemented by the *Espacio Común* association in the Independencia district, which seeks to develop the existing model of communal kitchen–dining rooms into multipurpose spaces for women's empowerment. In parallel, the project also intervenes in public space, promoting improved living conditions through an integrated and holistic approach (Espacio Común NGO, 2023).

Similarly, the *Parque N1 de Flor de Amancaes* project implemented by the *Ama Amancaes* association in the Distrito del Rímac combined recreation and urban gardening, while the *Adopt a Huarango*, project carried out by the Comando Ecológico association in the Villa María del Triunfo, Pachacámac, and Carabayllo districts linked ecological restoration of the *Lomas de* Lima[30] with fog-catching systems (*atrapanieblas*) for water collection[31] (Santoro, 2024).

Water collection initiatives include the Creating Water Foundation, which (with support from USAID) has installed 160 fog-catching systems, and the *Movimiento Peruanos Sin Agua*, which employs large nylon nets to capture between 189 and 378 liters of water per day for families living in conditions of extreme poverty[32], thereby address acute water scarcity in districts such as Villa María del Triunfo (Espinoza, 2023; Gibbens, 2023).

A more integrated spatial vision was proposed by the *Parque Lomas* project, which was

[28] The materials used were obtained through recycling and a shared self-management process between the REP team and local residents. UNICON donated the concrete blocks, while the grass was laid in coordination with the Lima Parks Service (SERPAR).
[29] The 21 selected projects are located in districts San Juan de Lurigancho, Villa El Salvador, Rímac, Cercado de Lima, Villa María del Triunfo, Comas, Independencia, El Agustino, and Cañete.
[30] The *lomas* are coastal hills, an ecosystem unique in the world for the vegetation that develops through winter mists, between 200 and 1000 meters above sea level.
[31] Fog-catching nets can collect up to 330 liters of water per day during winter, supporting water security and generating local employment.
[32] Thanks to this experience, they created a handbook on fog catchers, which gives people instructions on how to set up these temporary structures for "fog farming" (Schemenauer et al., 2005; Klemm et al., 2012). They use easy-to-find materials to make a low-cost, sustainable solution and work with local groups like FoqQuest, Studio WaterF'all, and *Movimiento Peruanos Sin Agua*.

developed by architect Marius Bastian Ege in collaboration with architect and professor Antje Stokman[33], and combines urban agriculture, fog capture, and community participation through a multifunctional path system that supports irrigation, recycling, and collective facilities (Galdames, 2014). Taken together, these experiences demonstrate that *Asentamientos Humanos* function not only as sites of deprivation but also as laboratories of architectural and urban experimentation in which collective open-ended processes enable adaptation to uncertainty. While such practices cannot be easily scaled into comprehensive regeneration models, they provide critical insights into alternative forms of spatial production, which emphasize participation, environmental adaptation, and cultural experimentation as essential components of more inclusive urban futures.

Conclusion and future perspectives

This paper does not claim to exhaust the topic, nor to have completely presented the rich variety of experiences which manifest themselves daily in these lively realities. However, both the spontaneous activities of individual inhabitants and the more organised ones, including those with institutional support, demonstrate a participatory commitment as well as a common predisposition to seek new solutions to improve quality of life within their communities. In these housing contexts, practices of production and consumption involve sharing, collaborating, reusing, repairing, and recycling. These aspects contribute to increased economic, social, and sometimes environmental sustainability at the local scale.

This is why *Asentamientos Humanos*, regardless of the problems that self-building may represent, are also places of architectural and urban opportunity and experimentation, in which incremental approaches and community practices find fertile ground through participatory processes and spatial self-organisation. As seen, many initiatives use collective effort, and thus human capital, as opposed to economic capital to construct space, and there is also an increasing focus on the shared management of one of the most important resources for life: water.

The collective open work offers flexible spatial configurations that support the involvement of local communities in the production of space, making it possible to combine the spatial organisation of informal settlements with self-constructed housing units. This mode of practice is open to a range of potential future developments, in which transformations of the urban fabric driven by inhabitants are not only expected but also embraced. It is increasingly evident that only a small proportion of the global population can afford housing constructed in a single, completed process. Therefore, the social and temporal variables introduced in the spatial formation of *Asentamientos Humanos*, in symbiosis with physical space, demonstrate an interesting alternative to traditional urban formation models.

The way forward lies in critically observing the manifestations of architecture “without architects” (Rudofsky, 1987). The mechanisms of spontaneous transformation offer insights into how communities adapt to scarcity, extreme conditions, and precarious living situations. Although these informal practices emerge primarily out of necessity, rather than from conscious design or environmental awareness, they sometimes reflect principles such as resource reuse, upcycling, or urban mining. Understanding these processes can inform interventions aimed at improving living conditions locally, but it is essential to recognize that scaling such practices to broader, structural regeneration programs remains highly challenging.

[33] Antje Stokman is Professor of Landscape Architecture at HafenCity Universität Hamburg, specialising in climate-adaptive urban and landscape strategies, particularly in Latin America.

Observing and critically examining these realities, while acknowledging their strengths, can facilitate the transfer of knowledge related to tactical approaches and lessons learned in such contexts to formally planned environments. Such reflections increasingly align with global priorities, including enhancing human well-being, reducing emissions, protecting and restoring biodiversity, and promoting social justice in accordance with the Sustainable Development Goals, all of which have become necessities and urgent priorities. Every project inevitably represents a gamble with the future, as uncertainty is inherent and, under current global conditions, continuous adaptation and revision are likely to be required over time. From this perspective, it is increasingly essential to include informal spaces within these reflections, not merely as areas to be discredited or discarded, but as sites of environmental adaptation and cultural experimentation with growing potential to contribute to addressing the complex challenges that lie ahead for our planet.

Acknowledgments

This paper is the result of a shared reflection between the author and Alexandra Patent, whose contribution included linguistic support, proofreading, and critical feedback throughout the drafting process. Given that *Asentamientos Humanos* are often characterized by informality and limited formal documentation, much of the available information is oral and lacks written sources. Additional insights into the current conditions of *Asentamientos Humanos* and the everyday lives of their inhabitants were provided by Father Alessio Geraci (MCCJ), who has been living and working among these communities for several years.

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