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Multidimensional Analysis of Urban Growth and Informal Consolidation in the Santa Rosa de Lima Settlement, Peruvian Andes, Huancayo, Peru (1985–2025)

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Abstract The general objective of this study is to examine the socio-spatial development trajectory of the informal settlement Santa Rosa de Lima de Huancayo, Peru, over 40 years (1985-2025), focusing on unregulated urban development and infrastructure interventions. Adopting a longitudinal case study design with documentary analysis, systematic observation, and household interviews, this study explores four axes of development: social, economic, environmental, and urban-architectural. The analysis reveals extensive and largely unregulated urban expansion, marked by degradation of public open space, an increase in self-constructed residences, and a semi-structured urban landscape. This irregular pattern gradually develops partially structured streets and block configurations. A defining moment occurred with the 2011 opening of the Amazonas Bridge, enhancing connectivity and facilitating local government-led urban densification. Nonetheless, such infrastructure did not fully address ongoing issues such as environmental deterioration, vulnerable land tenure, and limited access to basic services. Its society confronts systemic inequities that have called for large-scale adaptability and resilience. Adaptive resilience in such cases is therefore the measures that residents implement to respond to problems, redesign their space, and incrementally improve their accommodations and common space, while fostering social cohesion. The research contributes to the scarce literature on long-term informal urbanization in mid-sized Andean cities that tend to be neglected in favor of megapolises. While the vast majority of Latin American research resorts to municipal archives, aerial photography, and surveying households, it takes up for the first time a four-decade-longitudinal multi-dimensional approach that sheds light on consolidation processes outside metropolitan areas. Results highlight the significance of the policy on allocative equity of land, participative plans approach, and sustainable services provision, in particular for the socio-environmental context characteristic of mountainous territories. Generalizability is restricted by the fact that data is collected at one point. It is recommended to undertake additional research in order to examine the multi-scalar governance structure, climate vulnerability, and longitudinal assessment to better understand the variables responsible for driving consolidation and resilience in similar informal settlements.

Keywords Informal Urban Settlements, Socio-Spatial Dynamics, Peri-Urban Growth, Urban Consolidation, Human Settlements, Sustainable Development

1. Introduction

Experience of informal urbanization is a defining characteristic of cities in the Global South, largely driven by rural-urban migration, exclusionary land markets, and the inability of the government to provide affordable housing solutions [1]. Informal settlements, often lacking legal status, basic services, and essential amenities, typically emerge through processes of self-construction, collective action, and incremental consolidation [2]. It is crucial to conceptualize informal settlements as adaptive survival strategies employed by residents to cope with structural urban inequalities [3].

In Latin American cities, informal settlements are recurrent elements of the urban landscape. Frequently located in peripheral or ecologically sensitive sites, they typically experience limited access to basic services such as water supply, sewage, transportation, and security in urban areas [4]. In informality, more than just illegitimacy is implied by the term; it is the underlying structure of governance that entails negotiating spatial constraints, resources, and entitlement to citizenship [5]. Despite exclusion, such settlements reveal organizational rationality, community resilience, and innovative coping mechanisms to confront environmental challenges [6].

Urbanization itself is shaped by the interaction of spatial, social, economic, political, and environmental dynamics. Within these processes, informal mechanisms—including those enabled by privileged interlocutors—directly shape the morphology and institutional structures of cities [7]. The analysis of such changes enables a deeper understanding of the current urban situation and provides valuable insights for territorial policies. Human settlements, whether rural or urban, evolve due to migration, informality, infrastructure deficiencies, and population growth—factors that require urban policies to be reshaped in order to adequately address their processes and challenges [8].

Research on urban change in settings like Spain-for example, in Baza- Huéscar and La Portada de La Palma - has shown how settlement morphologies respond to economic and demographic changes, revealing that urban configuration is strongly shaped by historical context, residents' agency, and the development of transportation infrastructure. Recent research has employed GIS technology and statistical methods to examine these processes, confirming substantial transformations in urban configurations and reflecting on the sustainability of prevailing urban models [9,10].

Spontaneous urbanization in Andean cities follows similar patterns, driven by rural-to-urban migration, socioeconomic exclusion, and limited urban governance capacity, leading to the occupation of land on urban peripheries or in environmentally sensitive areas. Residents often resort to self-construction and incremental densification to consolidate their settlements. Informal settlements play a crucial role in urban growth, housing provision, the local economy, and social capital; however, they remain vulnerable due to chronic infrastructure deficits, exposure to environmental risks, and tenure insecurity. Addressing these challenges requires cities to recognize informal settlements as part of their development trajectory while fostering resilience, equity, and sustainable urban planning [5,8].

The spatial configuration of these settlements displays an underlying rationality derived from the requirements, concerns, and customary usage of the populace. While commonly regarded by outside experts as disorderly, it has a fascinating sense of coherence through versatility, openness, and stepwise densification [6]. Informal settlement housing construction adheres to three principal trajectories: (I) settlement of abandoned/unused lots of land, (II) incremental infilling of the preexisting urban environment, and (III) extension/modifications of formal structures, often skipping mainstream planning protocols and accommodating divergent analytical designs [2].

Historical evolution of human settlements relates to the processes under which urban areas change over time due to the influence of changes in populations, political decisions, economic parameters, and environmental constraints. An understanding of these processes is important for tracing the development, strengthening, or deterioration of informal settlements. Urban change in Latin America is the result of spontaneous self-constructed development as well as government policy, made possible by investments in basic structures, mobility provision, and social interaction [9].

The growth of informal settlements depends upon their internal decision-making structures and the resources they can mobilize to access services and consolidate their space. Santa Rosa de Lima Human Settlement of Huancayo, Peru, is representative of the broader informal urbanism pattern of the Andean region. Established in 1985 as an informal settlement, it has grown incrementally through self-construction activities, social management, and occasional state intervention. Importantly, the 2011 opening of the Amazonas Bridge has augmented physical access, encouraged denser settlement, and heightened pressures over space usage in the settlement.

Unlike the overwhelming mainstream of Latin American research that has narrowly focused upon metropolitan areas, this research contributes to the field by studying a mid-sized Andean city over the course of four decades. It draws upon a distinctive combination of municipal records, cadastral maps, aerial photography, and household surveys, and takes account of social, economic,

environmental, and urban-architecture variables. It highlights the informally consolidative processes of urbanization hitherto underemphasized in the literature and provides comparative insights that go beyond metropolitan-centric analyses.

This research investigates the socio-spatial evolution of the Santa Rosa de Lima settlement from 1985 to 2025. Employing a multi-dimensional analytical approach - involving urban, social, economic, environmental, and architectural dimensions - it investigates the inherent logic of informal development and its effects upon urban morphology. The temporal scope considers both historical trajectories and short-term projections derived from documented trends and current field evidence, ensuring analytical continuity over four decades. The results aspire to inform inclusive territorial management and sustainable urban development strategies. Furthermore, the research integrates spatial analysis supported by cartographic and statistical tools, thus addressing key gaps in the representation of informal settlement transformations. In this way, it is consonant with Sustainable Development Goal SDG 11, recognizing the necessity for inclusive, resilient, and sustainable cities, as well as with SDG 10, which addresses inequalities in urban territories [11,12].

2. Materials and Methods

This section specifies the methodology used in the study, including the study design, the type of study, duration, population, data collection, and processing methods, following established procedures for quantitative, qualitative, and mixed-methods research [13]. The techniques of analysis are also explained to enable a rigorous and systematic analysis of the historical evolution of the Santa Rosa de Lima Human Settlement from 1985 to 2025.

2.1. General Aspects of the Study Site

The Santa Rosa de Lima Human Settlement covers approximately 60,668.72 m ²and is located adjacent to the Shullcas River. It has two main access routes: Jr. Ayacucho, which connects to Psje. Verand, and Psje. Saúl Muñoz Menacho, from which several secondary streets emerge, including Psje. Primavera, Psje. Centenario, Psje. Los Geranios, Psje. Los Gladiolos, Psje. La Rivera, and Psje. Sandino. An additional entryway through Prolongación San Carlos joins Jr. Amazonas, enhancing connectivity. The settlement lies between Calle Real and Jr. Amazonas and is subdivided into 11 blocks, facilitating the spatial organization and planning of public services.

2.2. Study Design

This investigation employs a longitudinal case study method centered on Santa Rosa de Lima informal settlement in Huancayo, Peru, over 1985-2025. Although the design is non-experimental, the investigation is systematic in utilizing both quantitative and qualitative strategies to chart socio-spatial transformations over the prescribed time frame. Three central tools are embedded into the investigation: (i) a documentary analysis using municipal documents, cadastral maps, aerial photographs, and census reports to redraw historical trajectories; (ii) systematic observation using excursions to locations and photographic surveys to chart present-day physical and environmental conditions; and (iii) interviews with households that gathered residents' perceptions regarding social disposition, improvements to housing stock, and service access.

The temporal aspect was examined through a comparative assessment of four significant periods: the initial occupation phase (1985–1995), the early consolidation phase (1996–2010), the infrastructural intervention marked by the inauguration of the Amazonas Bridge (2011–2015), and the recent consolidation phase along with projections extending to 2025. This chronological arrangement facilitated the integration of historical data with current field observations and enabled the projection of short-term trends informed by identified patterns in densification, land utilization, and service delivery.

The design utilized here was particularly suitable for documenting development over time within Santa Rosa de Lima. It enabled integration of historical documentation with present-field data to present a transparently replicable account of the social, economic, environmental, and urban-architectural transformations that took place.

Data for the entire 40-year period (1985–2025) were analyzed using 10-year intervals for the urban and environmental dimensions, due to source availability, while the social, economic, and architectural dimensions were examined using all available historical and current data. For the urban and environmental dimensions, cadastral maps, aerial photographs, municipal documents, and archival records were used, allowing for the analysis of land use evolution, infrastructure, and public spaces over time. Current data for all dimensions were collected through household questionnaires and structured observation sheets, providing an empirical and updated perspective on the settlement’s social, economic, environmental, urban, and architectural conditions. Future estimates up to 2025 were projected by extrapolating trends observed in recent years, assuming the continuation of demographic, social, urban, and architectural patterns.

2.3. Type of Study

This study adopts an explanatory approach aimed at understanding phenomena rather than intervening in them directly. Its primary purpose is to provide a comprehensive understanding of fundamental principles and processes,

allowing for a systematic analysis of the historical evolution of the Santa Rosa de Lima Human Settlement and offering insights into its urban, architectural, social, economic, and environmental transformations [14].

2.4. Population and Sample

The population comprises all elements sharing similar characteristics, to which the study's conclusions can be applied. In this study, the population included 1,017 residents and 378 dwellings in the Santa Rosa de Lima Human Settlement.

The sample is a representative subset of the accessible population, selected to enable reliable generalizations [15]. A probabilistic sampling method was employed, ensuring that each individual, case, or element had the same probability of being selected. This random selection allows extrapolation of the results to the entire population.

The formula used to determine the sample size for both population and dwellings was:

$$\boldsymbol{n} = \frac{N \cdot Z_a^2 \cdot p \cdot q}{[e^2 \cdot (N - 1) + Z_a^2 \cdot p \cdot q]}$$

$$\boldsymbol{n} = \frac{1017 \cdot 1.96^2 \cdot 0.5 \cdot 0.5}{[0.05^2 \cdot (1017 - 1) + 1.96^2 \cdot 0.5 \cdot 0.5]}$$

$$\boldsymbol{n = 280}$$

Where:
n: Sample size
N: Population size, 1017
Z: It depends on the NC, 1.96
e: Maximum acceptable error estimate, 5%
p: Probability of the event studied occurring, 0.5
q=(1-p): Probability of the event occurring

Therefore, the sample for this study consisted of 280 residents of the Santa Rosa de Lima Human Settlement.

$$\boldsymbol{n} = \frac{N \cdot Z_a^2 \cdot p \cdot q}{[e^2 \cdot (N - 1) + Z_a^2 \cdot p \cdot q]}$$

$$\boldsymbol{n} = \frac{378 \cdot 1.96^2 \cdot 0.5 \cdot 0.5}{[0.05^2 \cdot (378 - 1) + 1.96^2 \cdot 0.5 \cdot 0.5]}$$

$$\boldsymbol{n = 192}$$

Where:
n: Sample size
N: Population size, 378
Z: It depends on the NC, 1.96
e: Maximum acceptable error estimate, 5%
p: Probability of the event studied occurring, 0.5
q=(1-p): Probability of the event occurring

Therefore, the sample for this study consisted of 192 households in the Santa Rosa de Lima Human Settlement.

2.5. Study Techniques and Tools

Three techniques were used in this study. The first was Documentary analysis, which facilitates the retrieval of relevant information from various written sources, such as books, scientific articles, historical archives, and reports [16].

The second was observation, which is based on the collection of data through direct perception of the phenomenon under study, without altering its natural course [16]. Finally, a survey was used, which is a structured data collection technique based on asking questions to a representative sample of individuals [16].

There were also three study tools. First, a document analysis sheet was used to organize and systematize the information extracted from various documentary sources [16]. Secondly, an observation form was used, to facilitate the structuring of information on characteristics, behaviors, or phenomena observed in a particular context [16]. This is detailed in Table 1.

Ultimately, the final tool was the questionnaire, which consists of a series of questions designed to obtain answers in a structured manner [16]. You can see it in Table 2.

The implementation of these techniques and tools was essential for analyzing the historical evolution of the Santa Rosa de Lima Historical Archive in Huancayo, facilitating the collection of information from documentary sources and regulations. In addition, it provided a comprehensive overview of the settlement's current infrastructure and social dynamics, as well as collecting first-hand accounts from its residents, which contributed to a deeper understanding of its evolution over time.

2.6. Data Processing Techniques

Microsoft Excel was used for data processing and analysis. It facilitated the organization and statistical treatment of information collected through surveys, observation forms, and document reviews. Its built-in functions and graphic tools ensured efficient, accurate, and structured handling of the data, supporting a reliable interpretation of the settlement’s evolution.

3. Results

This part of the study presents the results of a comparative analysis of the development of the Santa Rosa de Lima Human Settlement, in Huancayo, covering the period between 1985 and 2025.

For this purpose, a comprehensive examination of the social, economic, environmental, urban, and architectural spheres was carried out.

The information for the years before 2025 was compiled from documentary sources, archives of institutions, and other secondary records. In contrast, data for the year 2025 were collected directly through instruments applied to a specific sample, which allowed us to obtain an empirical and updated perspective on the settlement’s situation.

Many events preceded the consolidation of this human

settlement. On February 10, 1985, leaders linked to land invasions in Huancayo reported serious irregularities. This allegedly made threats and imposed arbitrary charges on the occupants, reflecting a profound disorganization in the informal occupation processes [17]. Subsequently, on October 13 of the same year, conflicts related to urban land tenure resurfaced [18], which intensified on December 23, when the Prefecture ordered the eviction of the squatters and questioned the lack of regulation in the allocation of plots and public resources [19].

Amidst this situation, on January 1, 1986, Congressman Alejandro Olivera Vila expressed his support for the human settlements, requesting the granting of property titles and defending the rights of vulnerable families against repressive acts [20]. A few days later, on January 6, The Single Union of Education Workers (SUTE) union spoke out against the sale of land it owned, highlighting the conflict between union interests and popular demands [21].

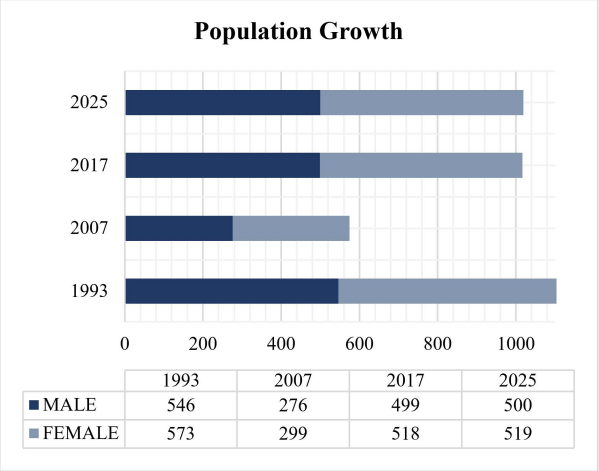
On January 7, the Municipality of Huancayo reported the illegal occupation of an area known as "Los Andes" and announced its intention to formalize this space to benefit disadvantaged sectors [22]. Finally, on August 12, 1988, a complaint of corruption was made public against the leader Arzapalo, who had led the seizure of land that would later become the Santa Rosa de Lima Human Settlement [23], thus consolidating a process marked by the conflict between the social urgency of housing and legal and political disputes over land ownership.

3.1. Social

This section explores the social evolution of the Santa Rosa de Lima Human Settlement from 1985 to 2025. The analysis is structured around four main areas: demographic growth patterns by gender, including the calculation of an index that allows for the prediction of the future population in 2025; educational progress as an indicator of social advancement among residents; housing use and ownership, reflecting economic conditions and urban consolidation; and, finally, the degree of citizen organization and participation within the settlement. These variables provide a comprehensive view of how this community has evolved from an initial settlement to a more consolidated and structured social environment.

3.1.1. Population Growth

As shown in Figure 1, the population evolution of the Santa Rosa de Lima Human Settlement has been marked by significant variations, reflecting the economic and social challenges of recent decades. In 1993, there were 1,119 inhabitants (546 men and 573 women) [24]. However, by 2007, the figure had fallen dramatically to 575 people [25], showing a drop of close to 50%. This decline could be due to migration motivated by a lack of opportunities, forced relocation, or unfavorable living conditions that prompted people to leave the area.



	1993	2007	2017	2025
MALE	546	276	499	500
FEMALE	573	299	518	519

Figure 1. Population Growth in the Santa Rosa de Lima Human settlement

Since 2007, there has been a demographic recovery. In 2017, the population increased to 1,017 individuals (499 males and 518 females) [26], which suggests an improvement in environmental conditions, such as access to basic services, security, and employment opportunities. Considering the estimated annual growth rate between 2007 and 2017 (i = 0.0768), it was estimated that by 2025 the population will reach 1,018 inhabitants, indicating a plateau in population growth, possibly related to urban saturation and a lower birth rate.

3.1.2. Educational Level

Over time, the educational level of the inhabitants has shown remarkable progress, reflecting a sustained process of social development. According to information provided by the National Institute of Statistics and Informatics (INEI), in 1993, a large part of the population had a low level of schooling: 60 people had no formal education, and 308 had only completed primary school. At that time, the number of residents with a university education was low (274), and there were no reports of people with postgraduate studies [24].

By 2007, in addition to a reduction in the total population, an improvement in educational levels was observed. The proportion of people with no formal education decreased, and the number of those with access to higher education, both complete and incomplete, increased [27]. This positive evolution continued in 2017, highlighting an increase in residents with completed high school (310), unfinished higher studies (90), and, for the first time, people with postgraduate training (23), which evidences an upward trajectory in terms of the education of the settlers [28].

Regarding the year 2025, the data were obtained directly through the application of surveys directed to a representative sample of the Santa Rosa de Lima Human Settlement. This primary collection made it possible to identify that, although some figures varied slightly, the trend towards greater academic training was maintained.

There was an increase in the number of people with secondary education, higher education, and postgraduate studies, indicating a growing inclination of the population towards professionalization and the search for better working conditions. As shown in Figure 2, these changes are clearly reflected in the evolution of educational levels across the different periods analyzed.

3.1.3. Occupancy of the Dwelling

With regard to housing occupancy, it was possible to understand the process of territorial stabilization of the settlement. In 1993, there were 108 houses inhabited by owners with legal title, while 49 were inhabited by owners without title. Likewise, there were 36 rented homes and 32 in the process of being transferred [24].

By 2007, the total number of dwellings had already decreased, and the category of occupation without title disappeared, which could be the result of legalization processes or evictions [27]. By 2017, a significant transformation was evident: the number of owners with title deeds grew to 136, and rented properties reached 121, probably due to an increase in new residents with formal residence status and confidence in investing in housing [28].

For the year 2025, data were collected through surveys of a representative sample of 280 inhabitants of the study area. As shown in Figure 3, these results highlight a clear trend towards formalization and greater security of tenure, with 194 homes having formalized property titles, which reflects a high degree of security of tenure. In addition, there was a reduction in the number of properties rented or transferred, which suggests a greater permanence and stability of the residents within the settlement.

3.1.4. Community Involvement

Over time, social organization within the Santa Rosa de Lima settlement has taken on an important role, manifesting itself through the formation of neighborhood associations, watch committees, and neighborhood groups. These structures have been essential in strengthening community ties, promoting improvements in the urban environment, and contributing significantly to the well-being of residents. They have also enabled more effective interaction with the authorities, demonstrating a high level of collective maturity and an active commitment to the sector's progress.

A recent example that reflects this level of community involvement was seen during the heavy rainfall drill carried out in the area. Residents actively participated alongside local representatives and emergency response teams, such as Huancayo Fire Department No. 30, the National Police Emergency Squad, SAMU, and Serenazgo. The exercise simulated a scenario of flooding and overflow caused by prolonged rainfall, in which citizens evacuated in an organized manner, collaborated with rescue efforts, and assisted in caring for the injured [29].

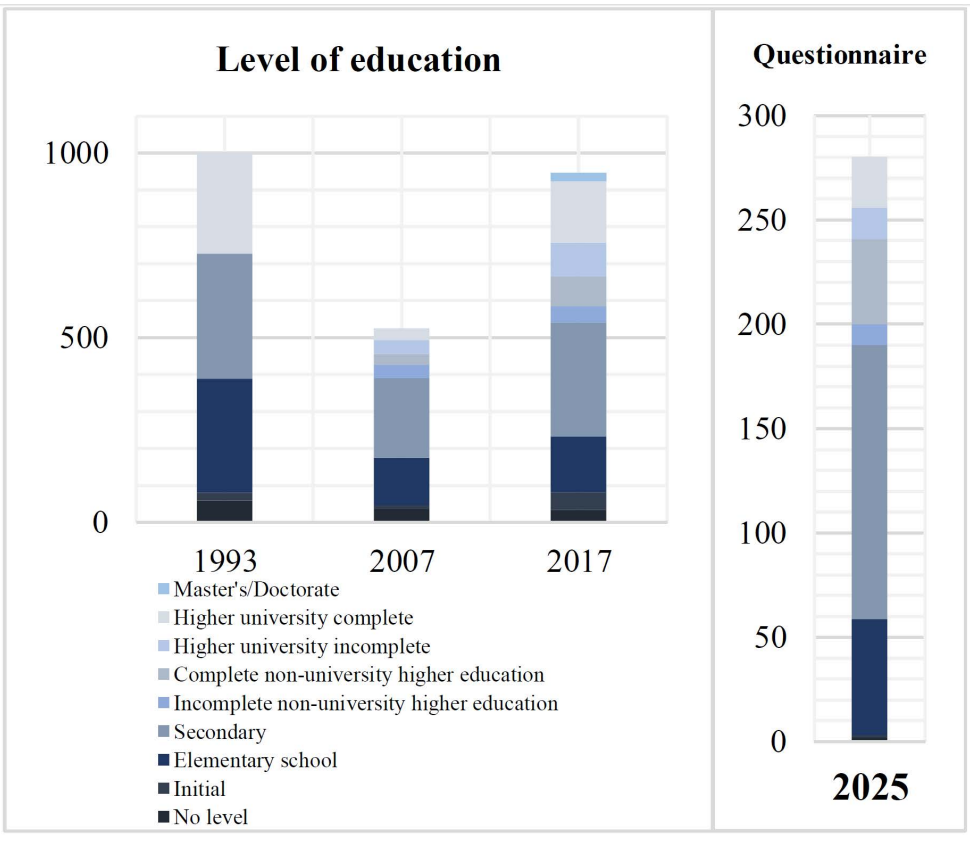


Figure 2. Level of education in the Santa Rosa de Lima Human settlement

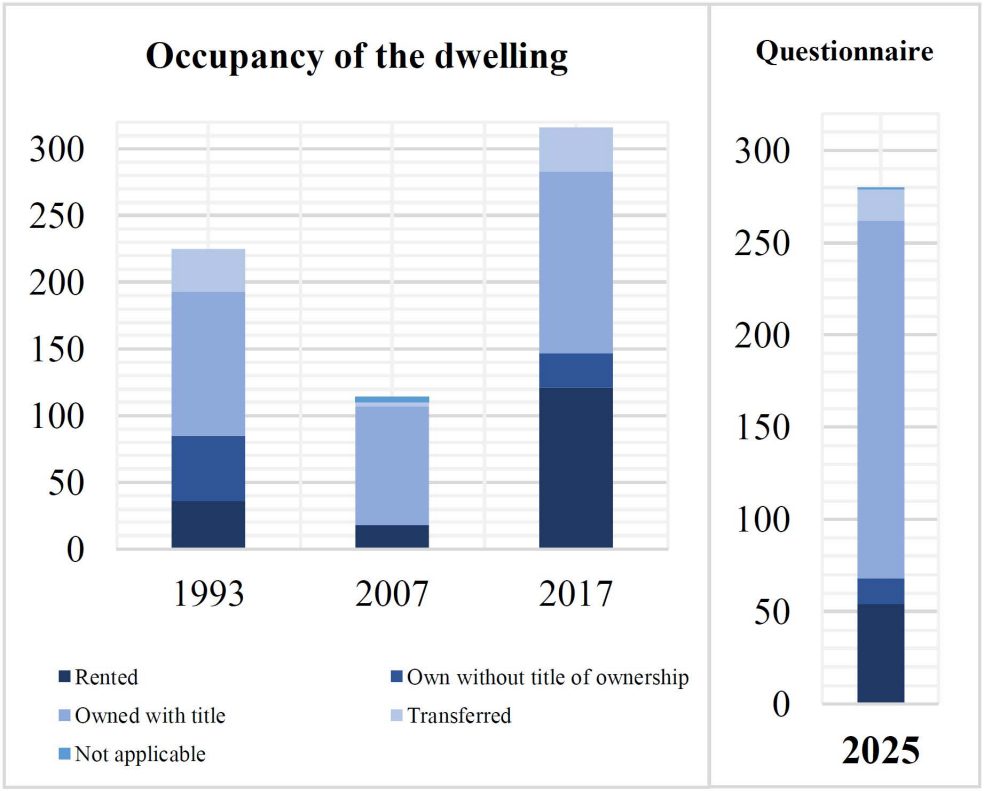


Figure 3. Occupancy of the dwelling in the Santa Rosa de Lima Human settlement

3.1.5. Accessibility to Equipment

Accessibility to educational facilities in the Santa Rosa de Lima settlement revealed significant spatial and temporal patterns closely linked to the process of unplanned urban expansion and the gradual incorporation of basic services, including education. In 1985, the settlement showed a high dependence on external educational infrastructure, as the few institutions available were located outside the consolidated urban fabric. This situation led to marked inequality in access, especially for schoolchildren, who were forced to travel long distances to attend classes.

During the 1990s, although some early childhood institutions closer to the community were integrated, educational coverage remained fragmented and reactive, without coordination with comprehensive territorial planning. The absence of a structured educational network within the settlement limited its capacity to meet the social demands arising from population growth, maintaining conditions of vulnerability in access to educational services. Figure 4 illustrates these spatial disparities and the progressive incorporation of educational infrastructure over time.

The period projected towards 2025 was considered a stage of consolidation in terms of educational infrastructure. The introduction of more complex and comprehensive facilities was observed, as in the case of Premier School, which offered all levels of education within the settlement itself. These types of institutions responded to a more efficient approach to land use, promoting neighborhood centrality that facilitated access to educational services and generated positive impacts in areas such as territorial equity, urban safety, and reduced travel times.

Likewise, greater territorial coverage and a more equitable distribution of educational facilities within the existing urban fabric were identified. In summary, the evolution of access to education in the Santa Rosa de Lima housing development reflected a transition from a situation of exclusion to a stage of progressive inclusion.

3.2. Economical

This part of the analysis addresses the economic evolution of the Santa Rosa de Lima Human Settlement during the period between 1985 and 2025. Emphasis is placed, on the one hand, on the predominant labor activities among residents, which allows us to identify the productive sectors with the greatest presence in the area; and on the other hand, on the labor condition of the population, which provides information on the linkage of people with the labor market, whether as employees, self-employed, employers, among others. For the year 2025, the data were obtained from surveys conducted on a representative sample of the settlement. The study of these variables made it possible not only to trace changes in the local economic structure but also to analyze the level of formality in employment and emerging opportunities in the productive environment.

Figure 4. Accessibility to educational facilities in the Santa Rosa de Lima human settlement

3.2.1. Main Occupation

The evolution of employment in the Santa Rosa de Lima housing association reveals significant changes in the economic fabric of the settlement. In 1993, unclassified or diverse occupations, labeled as "other activities" (197 people), predominated, followed by those working in commerce and services (104 people). At that time, there was no record of professionals or personnel linked to sectors such as construction or law enforcement, suggesting an economy centered on informality and daily subsistence [24]. Figure 5 shows the temporal evolution of the main occupations, highlighting the transition from informal activities to a more diversified economic structure.

By 2007, a modest diversification of productive activities began to be noticed, with the incorporation of 39 people engaged in professional work. Participation in trade and services remains relatively stable [27]. And in 2017, this change was consolidated, given that there has been a notable increase in the number of professionals (193) and commercial workers (127), and the construction, mining, and related industries sector has also become more strongly represented (82 people) [28]. Likewise, there is evidence of the inclusion of nine individuals in positions related to the armed forces and police, reflecting a process of integration into the state apparatus and a trend toward professionalization [28].

In the year 2025, the information was obtained through surveys applied to a representative sample of the population. Although there is a slight reduction in absolute values, participation in formal sector activities remains constant. Approximately 23 people were identified as working in professional areas, 73 were engaged in commerce, and 32 were linked to work in the construction or industrial sector.

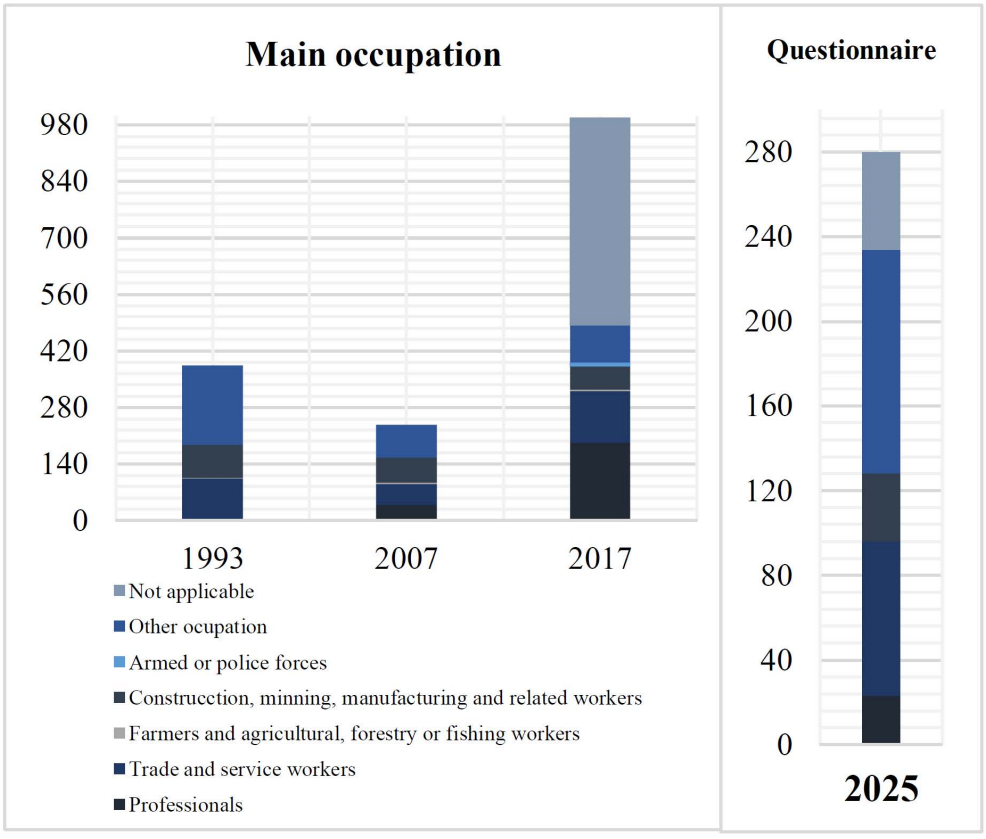


Figure 5. The main occupation in the Santa Rosa de Lima human settlement

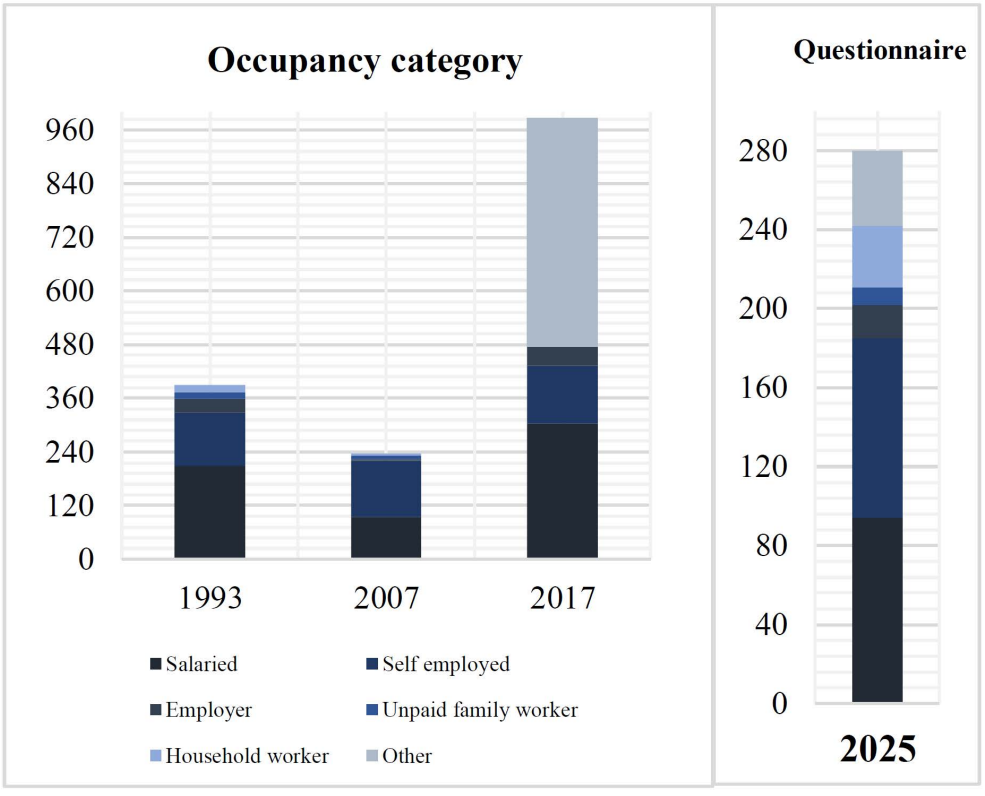


Figure 6. Occupancy category in the Santa Rosa de Lima human settlement

3.2.2. Occupation Category

The employment status of the inhabitants is another key factor in understanding the economic configuration of the settlement. In 1993, most workers were salaried employees (209 people), followed by self-employed workers (119) and a small group of employers (31). Unpaid workers (15) and those engaged in domestic work (16) were also counted, which shows that the economy is still fragile and has a large informal sector [24]. Figure 6 presents the evolution of employment status over time, illustrating shifts between salaried, self-employed, and other categories.

For 2007, due to the population decline during that period, there was a general decrease in the figures. However, it is noteworthy that self-employed workers (125) outnumber salaried workers (95), which could be interpreted as a response to formal unemployment, motivating the growth of self-employment [27].

In 2017, there was a drastic change: the number of employees grew significantly (303), as did the number of employers (41) and domestic workers (90). The category "others" stands out, grouping 513 people, possibly related to non-traditional or difficult-to-classify occupations, such as community services or informal technical jobs. This phenomenon suggests the emergence of new work dynamics that do not easily fit into conventional models [28].

Finally, the information referring to the year 2025 was obtained by applying surveys to a representative sample of the population. The results show a slight decrease in the number of people classified as wage earners (94) and employers (17). However, there is an upturn in the presence of domestic workers (31) and those who perform unpaid work (9). This situation could be interpreted as a sign of stabilization or adjustment within the domestic work environment.

3.3. Environmental

This section examined the environmental development of the Santa Rosa de Lima Human Settlement, covering the period between 1985 and 2025. The analysis focuses on the changes experienced by the green areas of the site, showing a steady decline as a result of rapid urban growth lacking sustainability criteria. In addition, the main sources of pollution currently identified show significant environmental deterioration caused by inadequate solid waste management, the discharge of wastewater into the Shullcas River, and the inappropriate use of public spaces such as parks and recreational areas.

3.3.1. Green Areas

The evolution of green areas in the Santa Rosa de Lima Human Settlement between 1985 and 2025 showed an urban transformation deeply influenced by the gradual loss of natural spaces as a result of the sustained advance of informal urbanization. In 1985, the settlement had 38.7% vegetation cover, reflecting the presence of extensive natural areas that had not been developed, mainly associated with vacant lots, riverbanks, and open areas located on the urban periphery. Figure 7 shows the spatial and temporal reduction of green areas from 1985 to 2025, highlighting the fragmentation and loss of ecological continuity.

However, by 1995, this coverage had fallen dramatically to 16.2% as a result of uncontrolled urban growth. Likewise, pressure for land for residential use led to the occupation and invasion of green spaces in a scenario of rapid urbanization lacking in planning. This dynamic of informal consolidation of the urban fabric progressively fragmented the original green areas, which were replaced by roads, housing lots, and other urban uses, without preserving adequate spaces for public or recreational use.

The year 2005 represented a critical point in this evolution, with a drop in green area coverage to an alarming 4.9%, a percentage that, according to projections for 2025, would remain unchanged. From then on, the remaining green areas were greatly reduced, scattered, and lacking in ecological connectivity, organized into small units without sufficient scale to respond to the environmental, social, and recreational functions demanded by the population.

This process highlighted the urgent need to reintroduce sustainability principles and environmental planning criteria into urban growth management. The drastic reduction in green areas between 1985 and 2025 not only meant a significant loss from an ecological point of view, but also a substantial decline in the well-being of residents, who saw their access to spaces for recreation, rest, community interaction, and contact with nature limited.

3.3.2. Pollution

For several years, the Santa Rosa de Lima settlement in Huancayo has faced various challenges related to environmental pollution, particularly in areas surrounding the Shullcas River. One of the most significant cases occurred on June 3, 2016, when neighbors reported that the Open Plaza shopping center intended to install large pipes to discharge its wastewater directly into the river. This action created a high risk of collapse in the local sewer system, as well as posing a direct threat to residents' health due to the possible increase in diseases and the appearance of vectors [30].

Months later, on November 20 of the same year, cleanup and desilting activities were carried out on the Shullcas River, led by the Civil Defense area and carried out manually by the community, local authorities, and various organizations, as heavy machinery could not access the area. During these actions, awareness campaigns were also carried out to prevent the dumping of solid waste into the river, and penalties were announced for those who continued to harm the ecosystem [31].

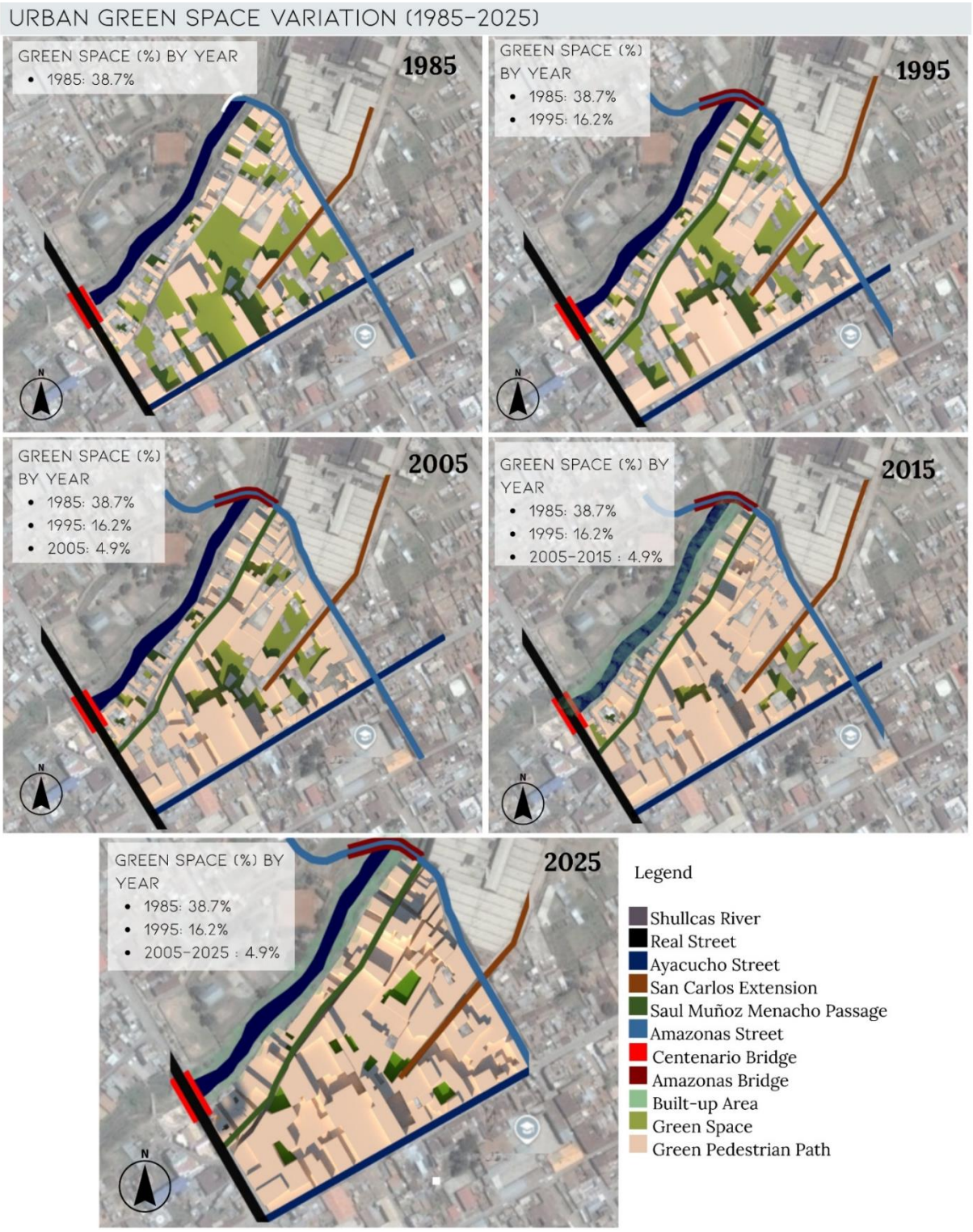


Figure 7. Green areas from 1985 – 2025

Despite these efforts, the problem persisted. In September 2019, a new cleanup day was organized on the riverfront, collecting more than 25 tons of accumulated trash, with the support of public institutions and the Barrio Seguro program, which highlighted the serious environmental deterioration of the area [32]. At the end of 2024, specifically on December 2, residents once again expressed their concern about the attempt to connect the drainage system of the Sebastián Lorente educational institution to the Shullcas River, using pipes with lower capacity. The community warned that this intervention would worsen pollution and cause overflowing mailboxes, already overwhelmed by the rains [33]. Figure 8 shows a map belonging to the Santa Rosa de Lima Human

Settlement. This corresponds to an updated representation for the year 2025, prepared with the purpose of locating and examining the areas most affected by pollution in the urban environment. The area analyzed is bordered by major roads such as Jr. Ayacucho, Jr. Amazonas, and Calle Real, and is crossed by the Shullcas River. This water source, far from being a valuable natural resource, has suffered severe environmental degradation due to various human activities, becoming a channel for the spread of pollutants. Six main sources of contamination have been identified within the settlement, which have been marked on the map with red warning symbols. The identified pollution points are:

a. Point 1: Calle Real and Saúl Muñoz Menacho Ln.

This point is one of the main sources of pollution within the settlement. The community disposes of waste indiscriminately and without guidance on environmental education issues, leading to a significant accumulation of waste. This situation negatively affects the hygiene of the area, compromising air quality, hindering mobility in the area, and altering the urban landscape.

b. Point 2: Los Geranios Ln. and Saul Muñoz Menacho Ln.

At this point, solid waste can be seen scattered on sidewalks and roads, the result of direct disposal by pedestrians. This form of urban pollution is evident and damages the visual image of the area, as well as posing a health risk to nearby residents.

c. Point 3: Dumping near the Shullcas River

The Shullcas River, which runs through the settlement, has a serious pollution problem due to untreated sewage discharges. At this specific location, a dwelling has been identified that discharges used oil and other wastewater directly into the watercourse, intensifying the level of pollution.

d. Point 4: Sandino Ln. and Saul Muñoz Menacho Ln.

What was originally conceived as a public recreational space has now deteriorated due to misuse by some people, especially those who are intoxicated. Broken containers, food scraps, plastic bottles, and various types of solid waste have been found scattered throughout the green area, contributing to its deterioration and detracting from a space that should be safe, clean, and healthy.

e. Point 5: Jr. Amazonas Stairs

This pedestrian access connecting Jr. Amazonas with the settlement has been turned into an informal waste disposal site and a scene of vandalism. The walls are covered with graffiti, while the surrounding area is littered with bottles, glass, and food scraps. In addition, the place is occasionally frequented by intoxicated individuals, which increases the risks of unsanitary conditions and deterioration.

f. Point 6: Sports court at Saul Muñoz Menacho Ln.

This sports facility, designed for entertainment and physical activity, has serious problems due to the poor location of the trash containers, one of which cannot be serviced by the municipal collection service. This limitation has led to a constant accumulation of waste, affecting not only the cleanliness of the place but also the health of those who use this infrastructure, especially children and young people.

3.4. Urban

The urban evolution of the Santa Rosa de Lima Human Settlement during the period between 1985 and 2025 shows a progressive process of consolidation, characterized by sustained growth in the built-up area and structural transformation of the urban layout. In 1985, built-up areas accounted for just 20.1% of the total, reflecting an early stage of occupation marked by scattered lots, extensive empty areas, and an incipient urban pattern. At this stage, non-existent or informal streets predominated, with no defined road network or effective connection to the surrounding area. The occupation was spontaneous and organic, with no regular subdivision or apparent road hierarchy. Figure 9 illustrates the spatial evolution of the built-up area between 1985 and 2025, highlighting the progressive consolidation of the urban fabric and the reduction of undeveloped land.

By 1995, the built-up area had increased significantly, reaching 37.9%, almost double that of the previous decade. This growth reflected accelerated densification, in which the urban layout began to take shape more clearly. Streets with more established outlines appeared, although they still had irregular geometries, and blocks with uneven contours began to form. The creation of lots was mainly in response to pressure from housing demand, often without technical planning, which led to urban voids and interstitial spaces, representing 22.1% of undeveloped land. During this stage, the road network remained fragmented, with limited connectivity between sectors.

By 2005, the built-up area had risen to 61.1%, marking a milestone in the consolidation of the urban fabric. Most of the available lots had been occupied, and there was greater continuity in the urban layout, with more regular blocks and streets that were beginning to form a more coherent road system. However, this consolidation took place even without the Amazonas Bridge, which considerably restricted connections with external areas and limited expansion towards the south and east.

In this context, the Santa Rosa de Lima Human Settlement is a clear example of the unplanned urban growth that has characterized the city's development in recent decades. Its informal origins, lacking technical and institutional support, have led to various structural deficiencies. Although it was included in the 2006–2011 Urban Development Plan (UDP) and later in the 2017–2027 Metropolitan Development Plan as an area undergoing consolidation, the fact is that the former expired in 2011, and the latter has not yet been fully implemented. This situation has seriously hampered the implementation of projects aimed at improving the living conditions of its inhabitants [34].

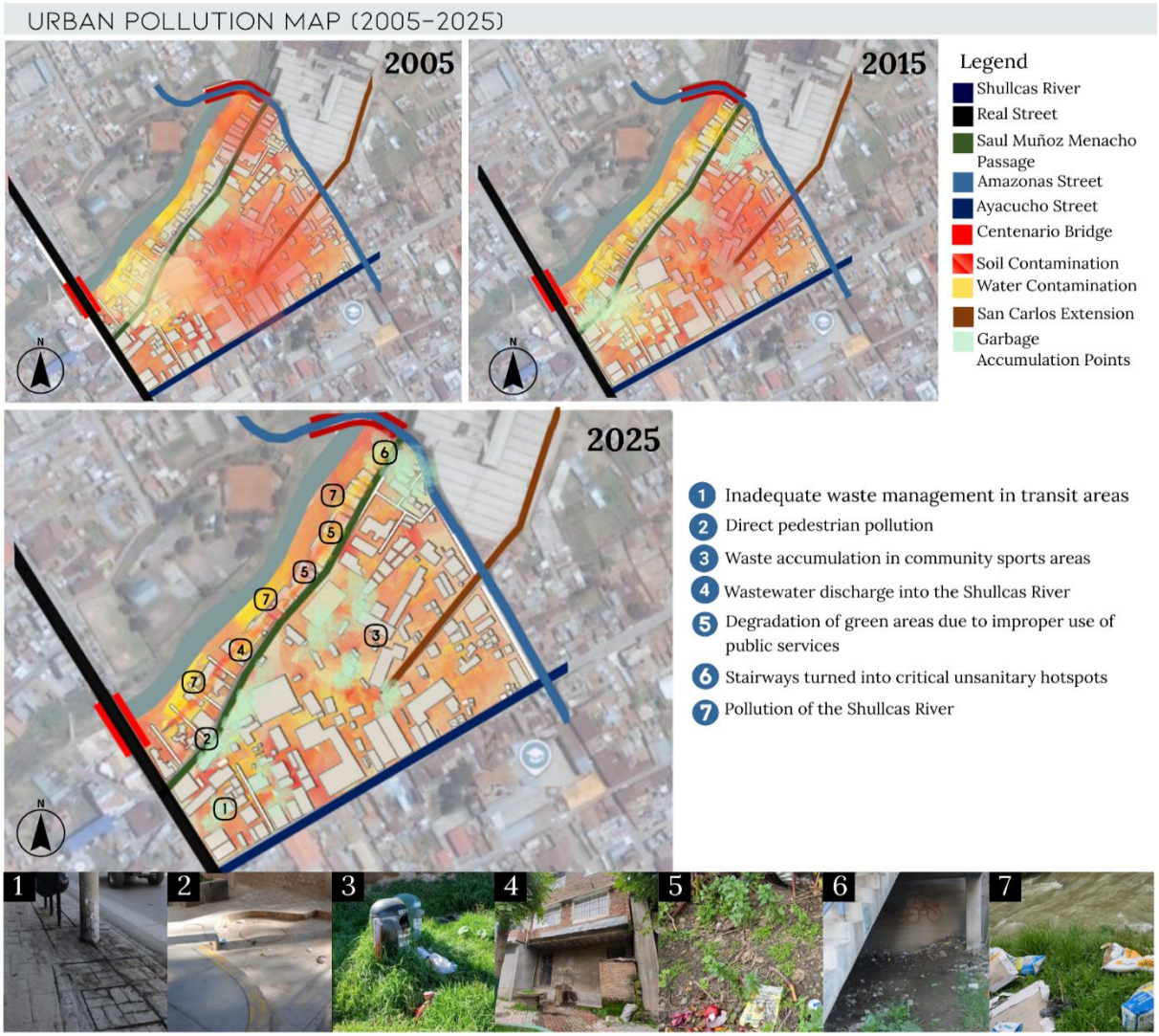
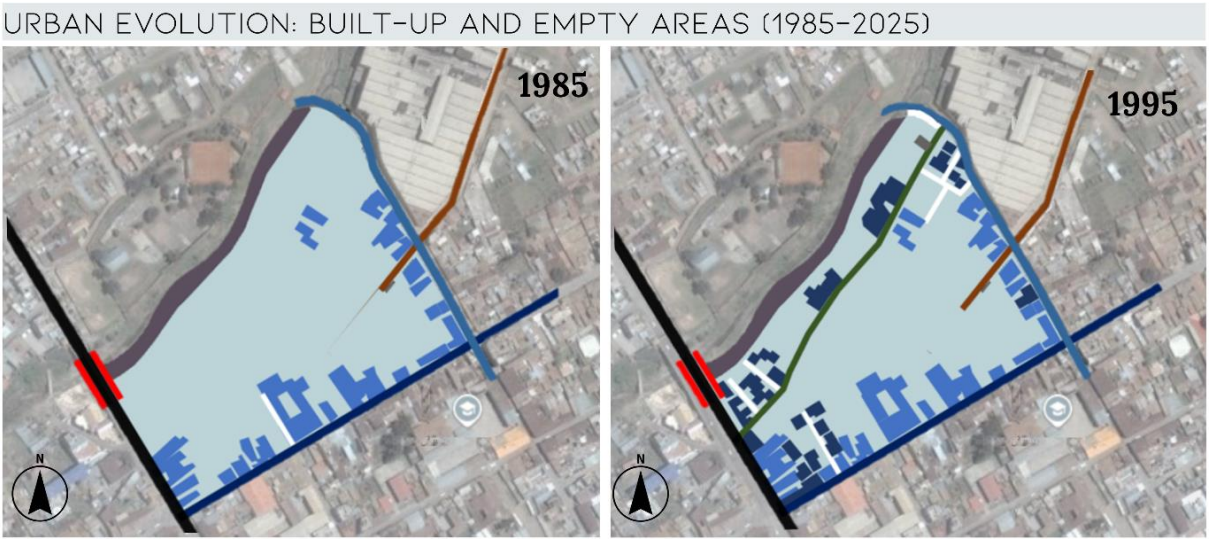


Figure 8. Contamination in the Santa Rosa de Lima Human Settlement



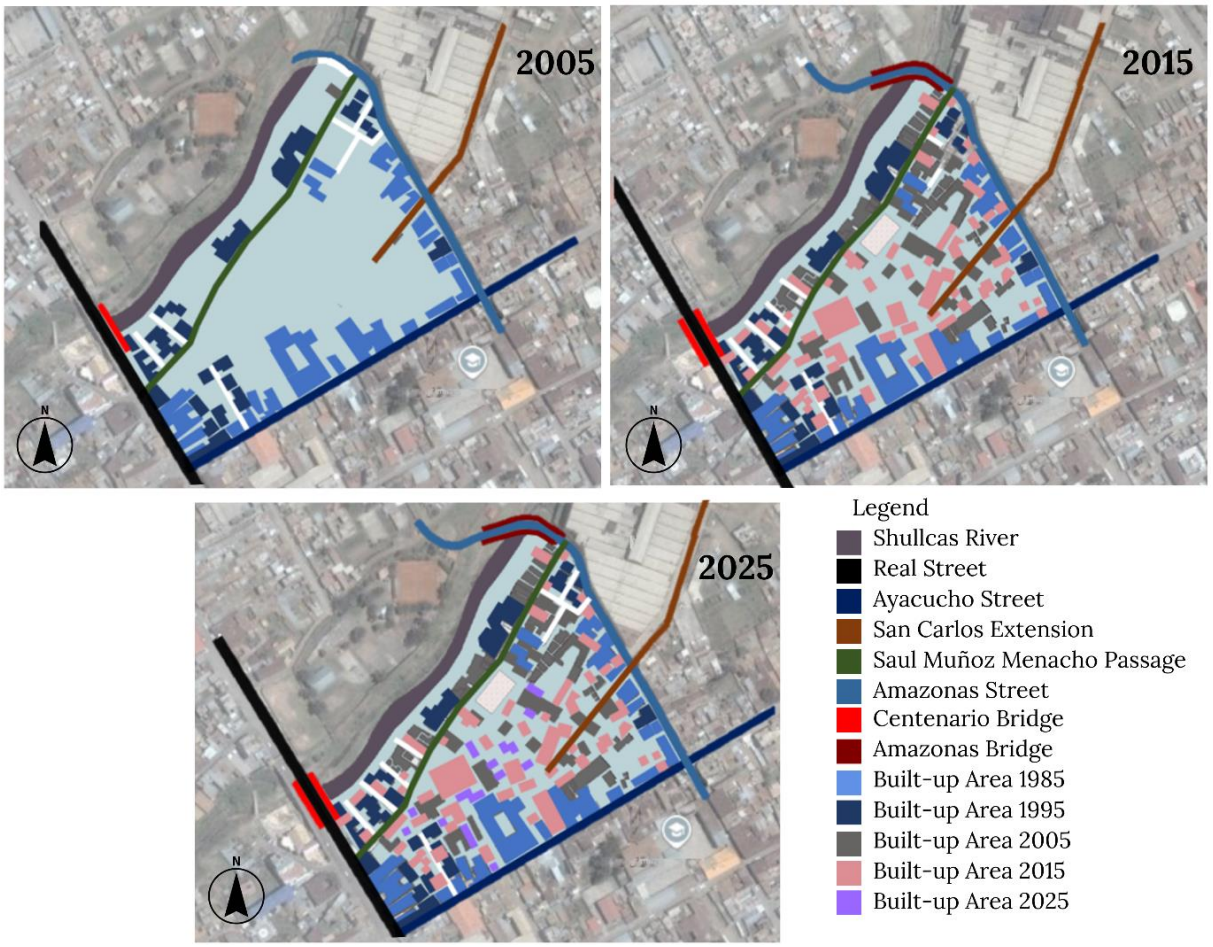


Figure 9. Urban Evolution in the Santa Rosa de Lima Human Settlement

It was not until 2011 that the Amazonas Bridge was opened, a key piece of infrastructure that marked a turning point in the urban development of the settlement. Its commissioning enabled a direct connection to the opposite bank of the Shullcas River, significantly improving both vehicular and pedestrian accessibility. This improvement in connectivity transformed the logic of urban growth: new secondary roads were defined, blocks were reconfigured, and previously isolated sectors were integrated. The impact of the Amazonas Bridge on urban densification was assessed by comparing satellite images, cadastral maps, and the built-up area before and after its inauguration. The increase in built-up blocks, improved connectivity of previously isolated sectors, and the reconfiguration of secondary roads indicate a clear influence of the bridge on the consolidation process. By that year, the built-up area had reached 67.6%, while the undeveloped area had been reduced to 4.3%, indicating that the urbanization process was practically complete.

Regarding land titles, the Urban Development Department of the Provincial Municipality of Huancayo reported that there are 158 deeds registered in the names of residents of the settlement. However, the area still lacks adequate access to basic services such as drinking water and sewage systems, currently relying on temporary solutions [35].

During 2022, Resolution No. 162-2022-MPH/GSC/SDCCDR represented a turning point in the territorial management of the settlement, declaring that the property located at 134 Las Gardenias Lane was in a high-risk area that could not be mitigated. This decision, backed by a technical inspection carried out by Civil Defense, limited any possibility of formal construction or urban formalization processes in that sector. The measure highlighted the vulnerability of certain areas of the settlement, especially those near bodies of water, where buildings had already been constructed without adequate technical criteria [36].

That same year, Resolution No. 241-2022-MPH/GDU reaffirmed this institutional position by declaring the appeal filed by the owner of the affected property inadmissible. This resolution not only confirmed the existing danger but also ratified the illegality of constructions carried out without a license or technical evaluation. With this, the municipality made it clear that it will not allow the regularization of buildings that compromise the safety of the population [37]. In the case of Human Settlement Santa Rosa de Lima, both

resolutions confirmed its status as a settlement at risk and highlighted the urgent need to implement urban planning aimed at safe, sustainable housing solutions that are consistent with the physical environment.

Finally, in 2025, the built-up area increased slightly to 68.9%, indicating that the settlement has practically reached its physical limit of expansion. The undeveloped area was reduced to a minimum of 2.9%, consisting of small vacant lots or residual spaces between buildings. The urban layout became consolidated as a practically defined system, with more regular streets, greater continuity between sectors, and a clearer road hierarchy. However, rapid and dense growth left little room for structural urban redevelopment or intervention, unless complex urban renewal processes are implemented.

3.5. Architectural

This part of the study examines changes in the architecture of the Santa Rosa de Lima Human Settlement over the period 1985-2025. The analysis focuses on three fundamental elements: the materials used in the different parts of the dwellings (such as roofs, walls, columns, doors, and window frames), the occupancy condition of the buildings, and the type of housing that predominates in the area. Information before 2025 was obtained by reviewing historical sources and institutional records, while data for the year 2025 were collected from an observation sheet applied to a sample of 192 dwellings in the area. The study of these variables made it possible to identify the level of progress in the buildings, the investment made by the families in infrastructure, and the degree of urban consolidation achieved in the settlement.

3.5.1. Housing Material

Over time, the materials used in the construction of the settlement's dwellings have shown a progressive evolution from informal solutions to more resistant and technical constructions, evidence of a sustained process of structural consolidation.

In terms of roofing, Figure 10 shows that in 1993, there was a predominance of calamine (101 houses) and a variety of materials grouped under the category of “others” (91). Only a minority used reinforced concrete for roofs (32 houses) [24]. Over time, this situation changed: in 2007, 74 dwellings were recorded with concrete roofs [27], and by 2017, this type of material became the most used, reaching 359 units [28]. This change evidences a progressive preference for more resistant and durable solutions, displacing materials such as wood and calamine.

As for the walls, the transformation was even more marked. As illustrated in Figure 11, in 1993, constructions with unspecified materials predominated (160), while only 54 dwellings were made with brick [24]. By 2017, brick was positioned as the most used material, reaching 654 units [28], indicating a sustained process of structural strengthening in the settlement's dwellings.

Figure 12 shows the evolution of structural columns over time. Regarding columns, in 1993, only 54 dwellings had reinforced concrete columns, while in 11 cases, no defined structural support was evident [24]. This figure increased significantly in 2017, when 654 dwellings incorporated concrete columns, reflecting a considerable improvement in terms of stability and safety [28].

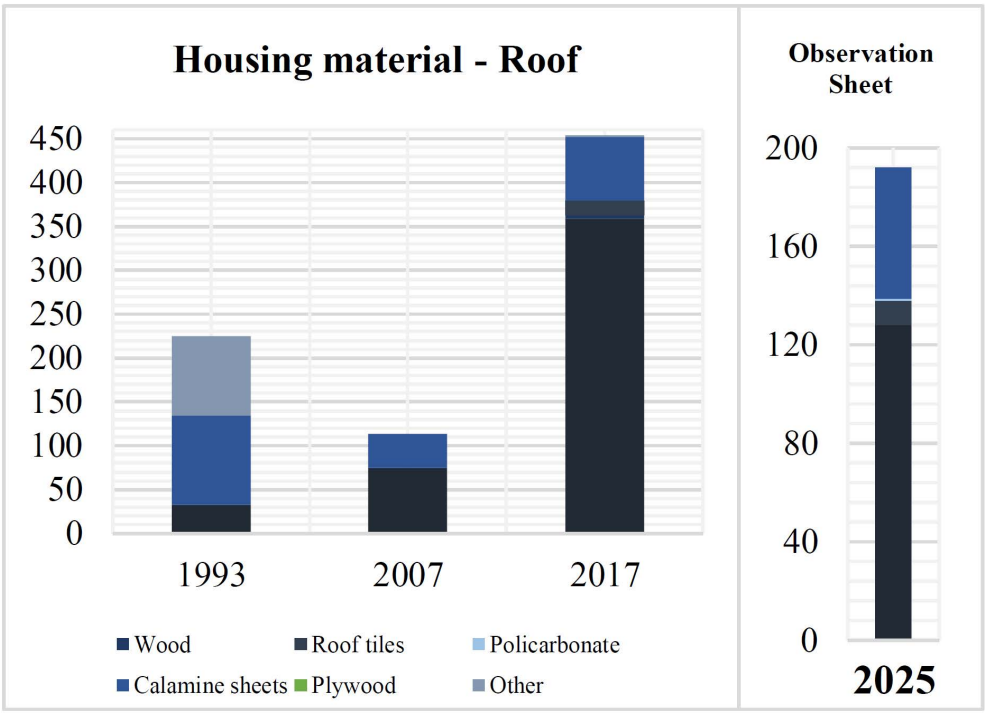


Figure 10. Housing material – Roof in the Santa Rosa de Lima human settlement

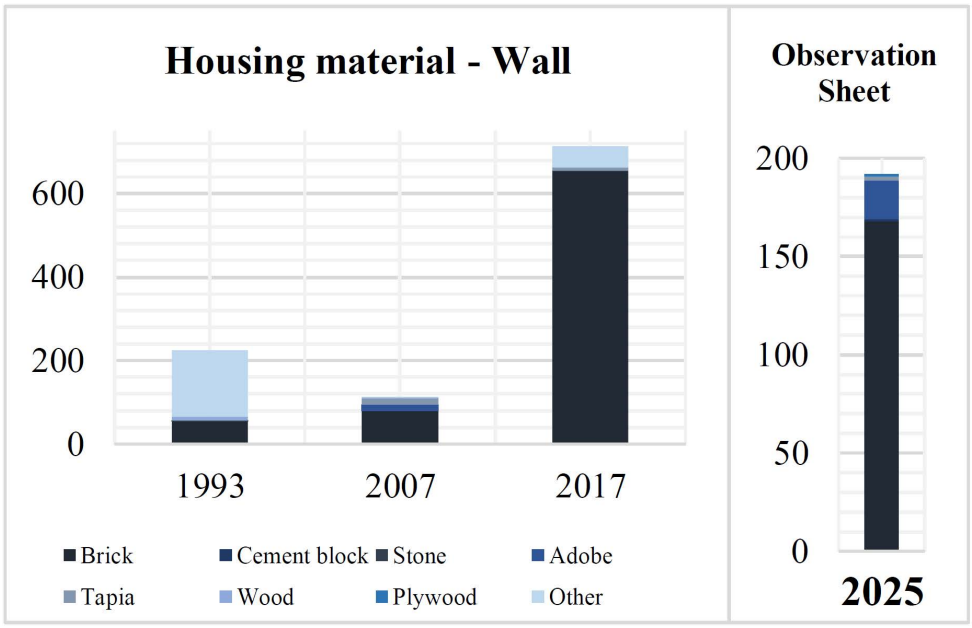


Figure 11. Housing material – Wall in the Santa Rosa de Lima human settlement

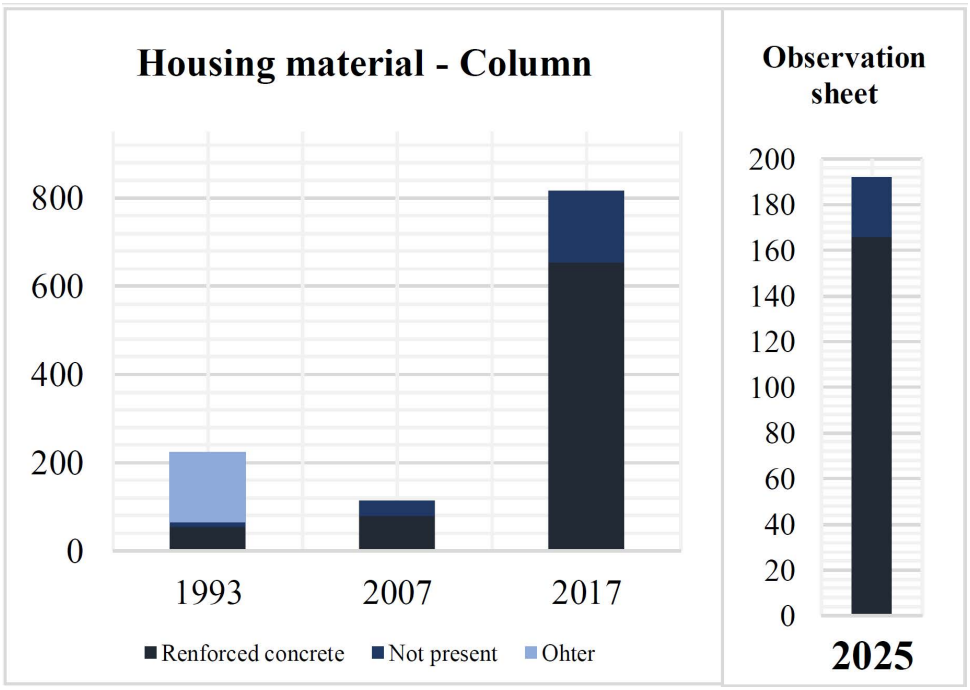


Figure 12. Housing material – Column in the Santa Rosa de Lima human settlement

Regarding doors, in 1993, those made of unspecified materials predominated (171 units) [24]. Figure 13 highlights the clear shift that occurred by 2017, metal became the most common material (654 units), followed by wood (163), showing a clear transition towards more robust and functional elements [28]. Figure 14 presents the evolution of window frame materials. Similarly, in 1993, wood was the main material used (171), while in 2017, metal took the lead with 654 units, suggesting an inclination towards more durable and resistant materials [28].

For the year 2025, information was collected through an observation sheet applied to a sample of 192 dwellings within the Santa Rosa de Lima Human Settlement. The results support the continued use of solid materials, with reinforced concrete still being the main component in roofs, walls, and columns, although in smaller numbers due to the small size of the sample. In addition, a greater variety is observed in window frames, with the incorporation of materials such as aluminum and plastic, while metal doors continue to predominate.

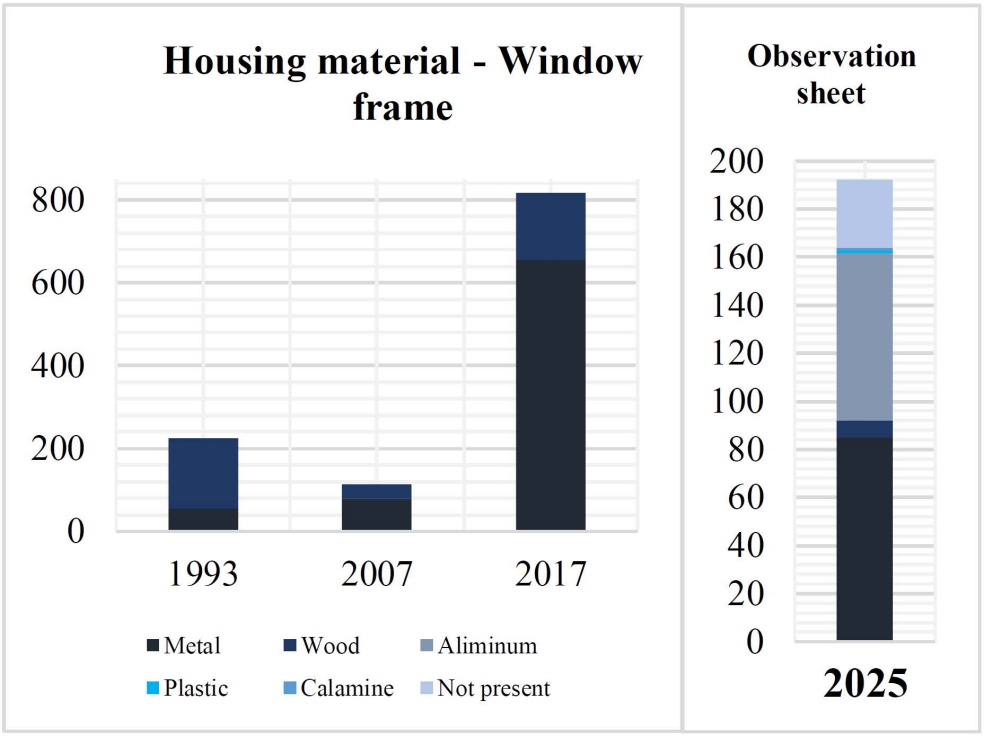


Figure 13. Housing material – Door in the Santa Rosa de Lima human settlement

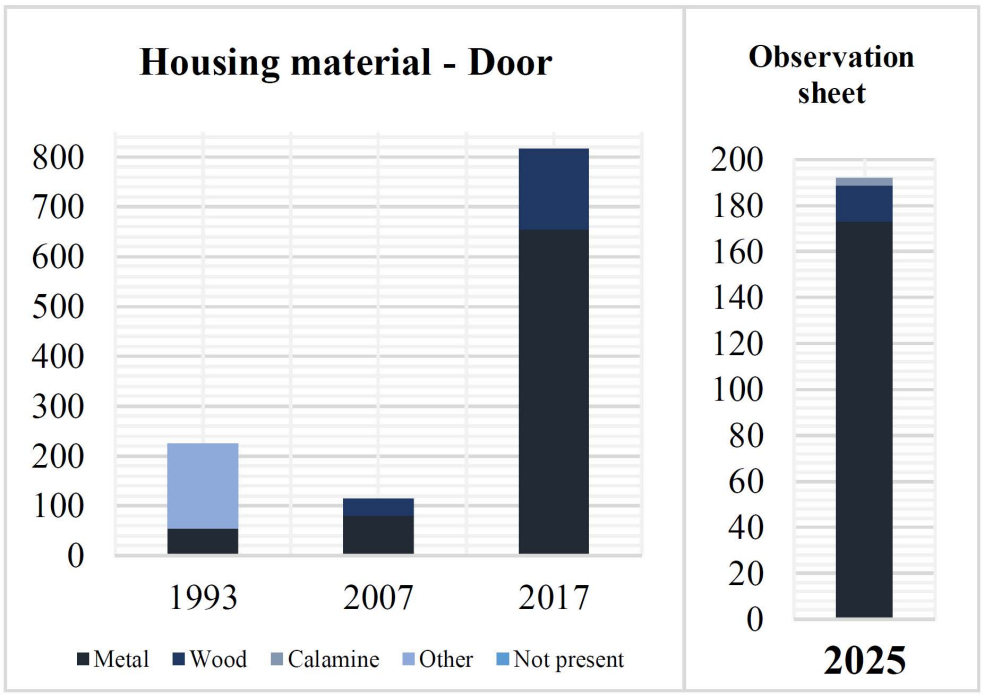


Figure 14. Housing material – Window frame in the Santa Rosa de Lima human settlement

3.5.2. Occupancy Status

The occupancy of dwellings has also varied over time. Figure 15 illustrates these changes. In 1993, the vast majority of buildings were inhabited (288) [24]. However, in 2007, this figure fell to just 116 occupied dwellings, which could be explained by migration, urban decay, or resettlement [27].

Since 2017, there has been a recovery, with 352 inhabited dwellings, which can be interpreted as a phase of population growth and improvement in housing conditions [28]. According to data obtained in 2025 through observation sheets applied to a sample of 192 dwellings in

the Santa Rosa de Lima Human Settlement, 186 inhabited units and only 6 unoccupied units were recorded. This information reflects a certain stability in the residential occupancy pattern. Unoccupied dwellings represent a low number of the total, which is due to situations of sale, renovation, or structural improvement processes.

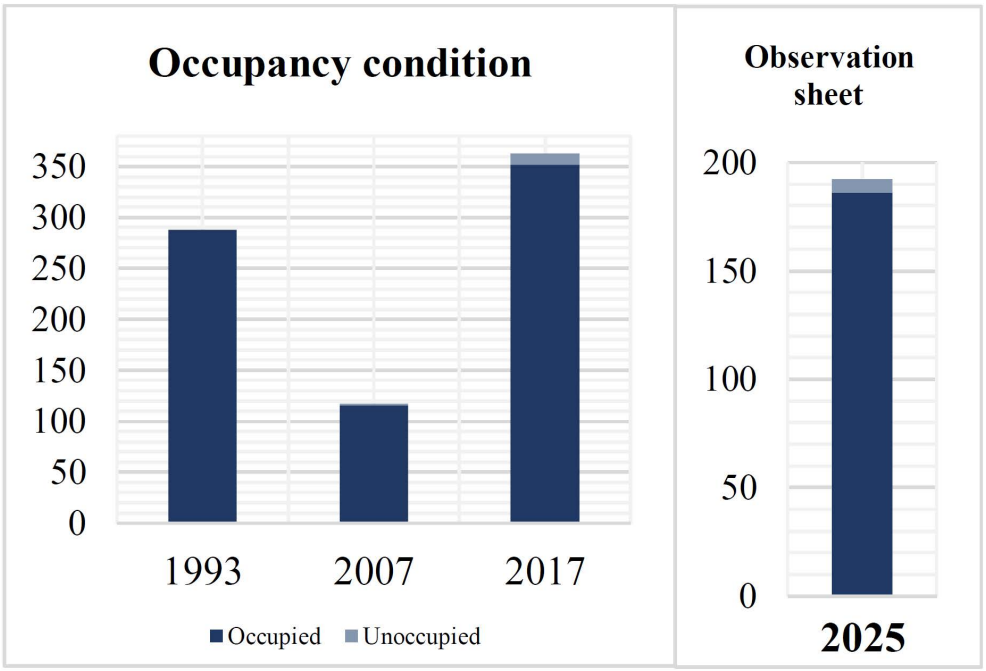


Figure 15. Occupancy condition in the Santa Rosa de Lima human settlement

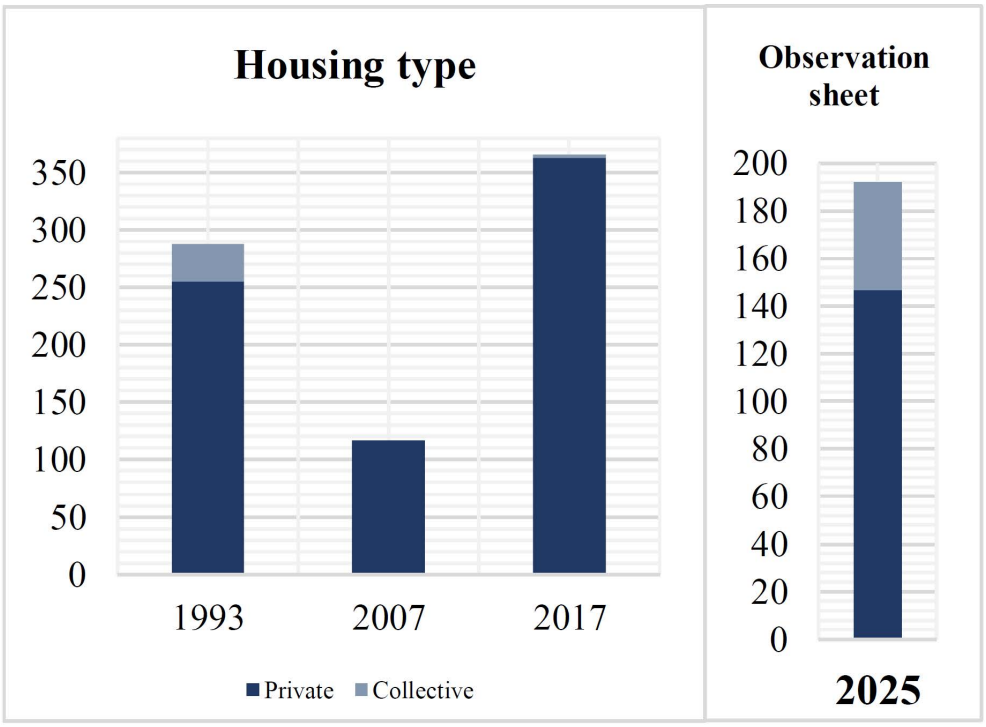


Figure 16. Housing type in the Santa Rosa de Lima human settlement

3.5.3. Type of Housing

With regard to the type of housing, there is a clear preference for private units throughout the period analyzed. As shown in Figure 16, in 1993, of the 288 registered dwellings, 255 were private and only 33 were collective [24]. In 2007, collective housing disappeared from the registry, reinforcing the model of individual housing [27].

However, in 2017, three collective dwellings reappeared [28], and in 2025, based on the analysis of observation sheets applied to all the dwellings in the Santa Rosa de Lima Human Settlement, 145 private dwellings and 47 collective dwellings were counted. The latter group shows a notable growth compared to previous periods, which could be associated with the emergence of new urban demands, such as the need for shared or multifamily housing, influenced by both economic and social aspects.

Despite the structural challenges identified throughout the settlement—such as environmental degradation, limited access to basic services, and unplanned urban expansion—the Santa Rosa de Lima community demonstrates notable adaptive resilience. Residents' strengths, including strong social organization, active participation in communal projects, and progressive formalization of housing, have allowed them to partially offset these weaknesses. For example, community-driven initiatives for environmental cleanup, coordinated disaster drills, and the incremental improvement of dwellings illustrate how social cohesion and collective action mitigate the adverse effects of structural deficiencies. These dynamics reveal a reciprocal relationship between the settlement's vulnerabilities and its adaptive capacities: while weaknesses persist due to institutional and infrastructural gaps, the community's proactive strategies foster stabilization, gradual consolidation, and incremental improvement of living conditions.

4. Discussion

From 1985 to 2025, the Santa Rosa de Lima Human Settlement experienced a fast and largely spontaneous process of urbanization, characterized by informal processes and subsequently impacted by infrastructure interventions, such as the Amazonas Bridge opening in 2011. This improved connectivity and triggered physical consolidation, but did not manage to erase deeply rooted social-environmental problems. Though accessibility was heightened and new building materials were introduced, entrenched problems like environmental degradation, lack of infrastructure, and lack of integrated planning remain.

It is the same pattern that has been noted in similar cases in Huancayo, like the Nadine Heredia Human Settlement, where city development took place without previous planning or adequate provision of basic services, resulting in fragmented growth and continued social vulnerability [38]. As per local studies, environmental degradation and access to public services are also compounded by the lack of territorial planning in peri-urban areas [39]. More generally, Haller et al. point out that Peruvian Andean urban sprawl has a tendency to risk arable lands and displace institutionalized land uses and thus requires an integrated approach to balance expansion towards development with soil protection [40], a situation similarly evidenced near the peripheries of Santa Rosa de Lima by the watersheds of the Shullcas River. Moreover, Rahmat et al. argue that investment in infrastructures for growing settlements lifts standards of residence only when informed by social and governance schemes [41], a situation evidenced in this case with added connectivity improvement.

Similar dynamics have occurred in Lima, especially in peripheral neighborhoods such as Villa El Salvador and San Juan de Lurigancho. They have also originated as informal settlements constituted through land invasion and self-construction, followed by successive consolidation spurred by infrastructure investment in the form of the Metropolitano system and road expansion. Uncoordinated urban planning and institutional management have, however, enabled deficits in public space, sanitation, and quality housing to endure [42]. Like Santa Rosa de Lima, these barrios represent the paradox of physical integration without structural inclusion.

In Bogotá, the case of Ciudad Bolívar is insightful. Sporadically developed urbanization on risky hillsides has led to a disjointed urban pattern and inadequate provision of services. Subsequent initiatives—the cable car system called TransMiCable and several programs for upgrading urban areas—did improve mobility and promote social inclusion. Yet long-term challenges like insecurity over land tenure, environmental risk, and weak governance continue to remain [43]. Similarly, in Quito, those peri-urban settlements called El Camal and La Ecuatoriana have informally extended over risky land. To make things worse, programs like "Barrio Mejorado," with goals to legalize and upgrade settlements, have lacked consistency due to scarce financial resources and political disturbances [44].

Similar to the informal settlements in Bogotá and Quito, Santa Rosa de Lima illustrates how infrastructure can create densification and morphological transformations as well. However, a lack of integrated structural policy undermines these gains. This case illuminates adaptive resilience by Andean cities and points out limits to infrastructure advancement when there is a lack of sustainable planning and active citizen involvement. Even though it is revealed through findings to have huge implications for housing policy and territorial planning among Latin American countries, it is unclear through the study whether implications are to do with tenure over land, participatory planning, or provision of infrastructure. Future studies can further explore these elements in depth to inform targeted interventions.

In conclusion, research requires and derives a demand for integrating ideas of sustainability, citizen participation, and effective land use management into urban planning frameworks. Santa Rosa de Lima serves as a relevant case for urban theorization and architectural practice, particularly with respect to why medium-sized Andean cities must adopt long-term territorial planning based on a sense of inclusivity to foster equity and resilience for informal areas of a city.

5. Conclusions

The evolution of the Santa Rosa de Lima Human Settlement from 1985 to 2025 is a process with various interrelated transformations involving social, economic, environmental, urban, and architectural levels. Over four decades, the settlement experienced progressive physical consolidation characterized by spontaneous growth, gradual land tenure formalization, and improved housing conditions. The Amazonas Bridge, opening in 2011, was a landmark achievement towards enhancing territorial connection and urban incorporation, though it did not fully overcome structural weaknesses inherent in the region.

Socially, the settlement revealed high educational levels, improvement in community organization, and a trend towards demographic stability—a community resilience indicator in an informal urban setting. Economically, there has been diversification of economic base from informal modes of livelihood to a growing number of wage earners, small business owners, and professionals, amidst informality dominance remaining a main issue.

Environmentally, the settlement has registered a significant loss of green areas with the birth of major pollution hotspots, specifically near the Shullcas River. In spite of community-driven initiatives, environmental deterioration continues to be an unresolved issue. On an urbanization basis, by 2025, the settlement achieved 68.9% of built coverage, marking close to complete land occupation. The result has come at the cost of strategic planning and has produced a compact yet fragmented urban texture with little green infrastructure.

From an architectural perspective, the dwelling stock has become increasingly composed of more durable materials such as reinforced concrete and brick to reflect enhanced efforts by families and greater stability of space. The multifamily residence increase implies growing settlement occupation trends corresponding to changing social and economic circumstances. Informal construction dominance and insufficient technical monitoring—especially in high-risk locations—remain the main challenges. Lastly, the Santa Rosa de Lima case sheds light upon the complex and accommodating character at work amidst middle-sized Andean cities. The case makes an important point about considering informal urbanization as a gradual, negotiated, and dynamically spatially constructed process by internal community agency and by external infrastructural initiatives.

The study has several limitations. First, the dependency on documentary research on documentary analysis, structured observation, and household surveys may have overlooked informal or undocumented activities and local perceptions not captured during data collection. Second, temporal discontinuities or holes in records that are available can have compromised longitudinal observation continuity. Thirdly, extension to other informal settlements has to be carried out with caution, considering the socio-spatial unique attributes of Santa Rosa de Lima.

Future studies might overcome these limitations by integrating longitudinal ethnographic studies, participatory mapping, and advanced spatial modeling. In addition, other studies can further explore the particular policy implications for land tenure, participatory planning, and provision of infrastructures in Latin American informal settlements. Comparative studies at medium-sized Andean cities can further enhance comprehension of adaptive measures and inform wider and more inclusive urban planning interventions.

APPENDICES

Table 1. Observation sheet

OBSERVATION SHEET										
GENERAL DATA										
Location								PHOTO		
Registration Number										
Name of Access Road										
Levels		1		2				3		Other:
Balconies		Si		No				Quantity:		
Type of Access Road										
Characteristic of the land		Flat		Mountainous				Near bodies of water		Other
HOUSING MATERIALS										
Parts of the dwelling	**Materials**									PHOTO
Ceiling	Reinforced concrete	Wood	Roofing tiles	Polycarbonate	Calamine sheets	Plywood	Other:			
Wall	Brick	Cement block	Stone	Adobe	Tapia	Wood	Plywood	Other:		
Column	Reinforced concrete			Does not count			Other:			
Doors	Metal		Wood		Calamine		Other:			
Window Frames	Metal			Wood			Other:			
TYPE OF HOUSING										
Occupation status	**Employed**	With people present				With people absent			Occasional use	
	Unemployed	For rent or sale		Under construction or repair		Abandoned or closed			Other cause:	
Type of housing	**Private housing**	Detached house	Apartment in a building	Dwelling in a fifth house	Dwelling in a tenement	Shack or hut	Makeshift dwelling	Premises not intended for human habitation	Other:	
	Collective housing	Hotel, hostel, boarding house, guesthouse	Health establishment	Penitentiary establishment	Residential care center for the elderly	Residential care center for children and adolescents	Convents, monasteries, or similar	Barracks, camp, base of the Armed Forces, or the PNP	Other:	

Questionnaire on Historical Evolution

Dear participant,

The purpose of this questionnaire is to gather information on the historical evolution between 1985 and 2025. Your participation is essential to understanding the changes that have occurred in the community and how they have impacted the quality of life of its inhabitants. The information you provide will be used exclusively for academic and study purposes, guaranteeing the confidentiality and anonymity of your responses.

Instructions:

- Mark with an (X) the option that best represents your response.
- If the question requires an open response, please write your answer in the space provided.

Table 2. Questionnaire

N °	ITEM	ANSWER
DIMENSION 1: SOCIAL		
1	Gender	Female
		Male
2	How old are you?	
3	In what year did you or your family arrive in this settlement?	
4	What was the last level of education you passed?	No level
		Initial
		Primary
		Secondary
		Higher non-university incomplete
		Higher non-university completers
		Higher university incomplete
		Higher university completion
		Master's/Doctoral degree
5	The dwelling it occupies is:	Rented
		Owned without title
		Owned with title
		Transferred
		Not applicable
DIMENSION 2: ECONOMIC		
6	What is your main occupation?	Professionals
		Trade and service workers
		Farmers and agricultural, forestry, or fishery workers
		Construction, mining, manufacturing, and related workers
		Armed or police forces
		Other occupation
		Not applicable
7	What is your occupation category?	Salaried employee
		Self-employed
		Employer
		Unpaid family worker
		Household worker
		Other

Thank you for your time and collaboration in this study.

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