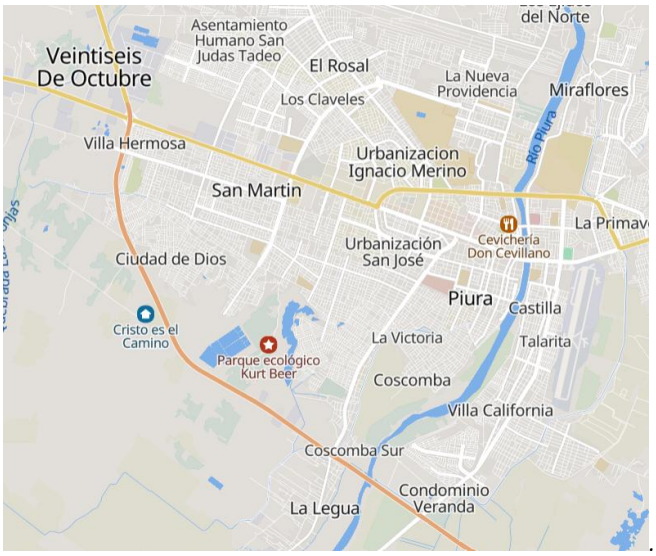
Self-construction of homes in the City of Piura, Peru.

By Jan Bredenoord, urban planner and housing researcher.

Urban development in the city of Piura in Peru is strongly related to the demand for affordable housing. Piura still has sufficient land for urban expansion. Traditional self-building of homes, within land-for-house plans (sites-and-services) is a common form of organized social housing. In the city of Piura, especially in the municipal district of "26th of October", a massive growth of human settlements occurred from 2000 on. Flooding may occur in parts of the district which restricts the growth of residential areas. The large-scale expansions in Piura are compared with the developments of some suburbs of Lima. The challenges for public housing in Piura are described, based on an analysis of some experiences in the 26th of October. Promoting the structural quality of homes is necessary throughout Peru, and certainly also in Piura.



Map of district municipality 26th of October, within provincial municipality Piura

Aerial view of pattern of housing in the city fringes of Piura

Introduction to the City and Region of Piura

This paper describes the practice of self-build housing in the City of Piura in Peru. Research has been done to visualize self-build housing practices there, and to compare it with similar housing practices in three self-build cities in metropolitan Lima: Villa el Salvador, Huaycán, and New Pachacútec, which are presented elsewhere on this website.

The self-construction of homes in Peru as a whole is around 25 billion soles (converted 6.3 billion Euro) each year, which is equivalent to 4.1% of the national gross domestic product (GDP). Seven out of ten homes in urban Peru were built through self-construction. Similarly, there are currently 2.9 million homes in the active process of self-construction, 1.6 million of which are of precarious material and the remaining 1.3 million are of decent material. In this regard, the study indicated that 94% of these houses are built, managed and achieved by master builders[1].

According to Grade's research, only 2% of families have access to a mortgage loan to build their own homes, which means the rest use personal loans (23%), other savings mechanisms, and the collection of building materials. The average household expenditure of the self-builders, is S/1,550 (converted: 370 Euro) per month for eight years, which would be enough to pay for a mortgage loan from the MiVivienda Fund, and by adding certain incentives from the state[2].

The city of Piura is divided into four municipal districts. One of them is the municipal district “Piura”, that borders the municipal districts Catacaos and “Veintiseis de Octubre” (26th of October). The latter includes neighborhoods and barrios and the many AHs (human settlements), where natural disasters affected vulnerable homes and its residents. When earthquakes or floods happened, there were various consequences for the homes and the residents. This paper focus mainly on the municipal district “26th of October”, with as examples three AHs: Ciudad de Dios and surrounding, Las Capullanes and Michaela Bastides, and Los Polvorines. The threats of earthquakes and floods are real in the mentioned Human Settlements. The entire Piura region was severely affected by the floodings in 1997-1998, and some 18,000 homes suffered extensive damage.

The color blue means: formal buildings in formal neighborhoods with all services and facilities.

The color red means informal (residential) buildings, usually in formalized residential areas, with shortages of roads, facilities, where improvement processes are taking place or are still needed.

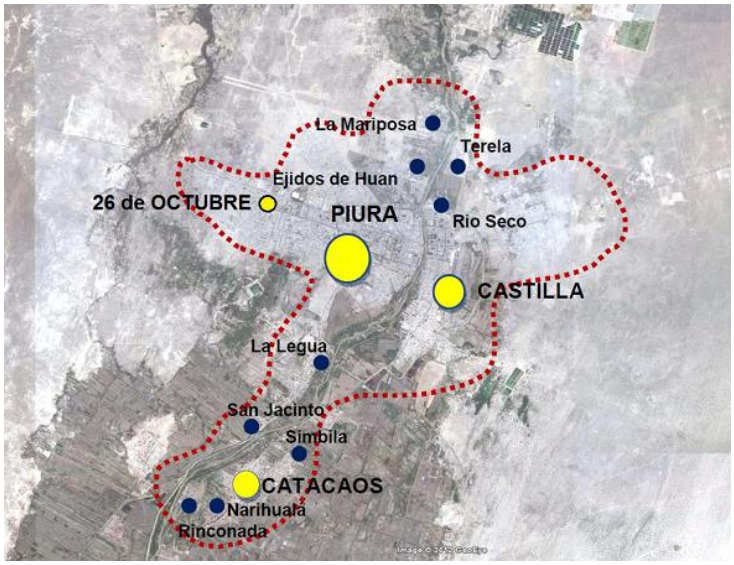
[1] Source: Study by Development Analysis Group (Grade) presented at the Expo Real Estate Peru 2024.
[2] El Comercio Newspaper, June 2024

The whole Region of Piura is prone to disasters, recent examples are:

- floods in Piura: during the El Niño phenomenon in 2017; parts of Piura suffered severe flooding, reflecting the region's vulnerability to extreme events; some 18,000 homes suffered extensive damage;
- earthquake in Sullana, 30 kms north of Piura: on July 31, 2021, a magnitude 6.1 earthquake with an epicenter in Sullana, caused significant structural damage in the center of Piura;
- the 2024 drought: the Piura region faced a severe drought, affecting the agricultural sector and the residential areas, which led to the declaration of a water emergency.

The City of Piura and its districts

Piura is located on the northern coast of Peru. Piura is also the capital of the Region (department) and the Province (provincial municipality), both governmental entities of the same name. The area of the city is also called “Metropolitan Piura”, being one of the 10 urban regions in Peru. The City is located centrally in the Region of Piura, in the valley of the Piura River, north of the Sechura desert. Piura has a warm and semi-arid climate, but is regularly affected by heavy rainfall during El Niño years. Piura is located 950 km north of Lima; the altitude is medium low; 31 meters over sea level. Its proximity to the border with Ecuador, and its location in a transit zone between the coast and the mountains, give the Region a strategic geographical position. Metropolitan Piura, covers the urban territories of four mentioned municipal districts. According to the National Institute of statistics and Information (INEI), the city will have an estimated population of almost 600,000 inhabitants in 2025, which makes it the fifth most populous city in Peru. In 2013, the district Piura was administratively divided into two municipal districts, namely: Piura and Veintiseis de Octubre (26th of October), the latter has 200,000 inhabitants in 2025. It was difficult for families to find land to build a home on, so they often ended up on the outskirts of the city on land that was not their property. The municipality intervened by preparing and executing subdivision plans for the individual construction of family homes. It was often hard to get a title deed of the plot, and access to housing finance. Many families had to deal a long time with inadequate roads, and a lack of services and facilities in their settlements.



Border of Metropolitan Piura

About self-construction

Self-build (in Spanish: *autoconstrucción de vivienda*) is a process by which households build their own homes, often with limited resources, without professional construction workers, or reliable contractors. Self-build families do this because they have low or extremely low incomes. Many of the households build or renovate their homes through self-construction or self-management, often with help of relatives and friends. Sometimes they hire construction workers for specific parts of a home, such as foundations or roof structures. Initially, housing quality is not high and the pace of construction is often low[3]. Many self-built homes are not resistant to floods or earthquakes. Often there is no good drainage or sewerage system in parts of the city. Self-building households often make use of cheap building materials, such as wood, corrugated sheets for roofs, adobe, and recycled materials. To improve this situation, technical assistance for self-builders is needed on a large scale. Financial support for self-builders is provided by the Peruvian government, but the demand for housing subsidies is much greater than the supply, although the fund "MiVienda" and its programs Techo Propio, Sitio Propio, and Bono Familiar Habitacional, give support for self-build housing by families. The City of Piura created its own program "Mi Vivienda Protegida", an initiative aimed at benefiting hundreds of households in poverty and extreme poverty, that have suffered damage as a result of Cyclone Yaku and the intense rains of recent years. Occasionally, some NGOs with housing programs can be active in Piura, which almost always offer help to households with very low incomes. Technical assistance and financial aid are the two pillars of traditional self-build social housing, connected to a sites-and services culture as practiced in Peru. This support system has also been active in Piura.

Housing quality of self-constructed homes

The City of Piura and building professionals discovered that housing quality in many human settlements is rather low. More than seventy percent of the houses were built informally, often without supervision, municipal building control and technical assistance. Housing quality can differ from district to district, from AH to AH, and from house to house.

As the Piura region is in risk of an earthquake, housing quality demands specific attention. Many informally built homes can pose a serious risk to residents, especially if the homes were severely damaged during a strong quake. This means that data on housing quality in informal human settlements must be examined and linked to relevant data on the permanent earthquake risk.

The risk of flooding is also real in the Piura flood plains, including parts of the districts Piura and 26th of October. Specific structural measures to make the homes earthquake resistant and/or flooding resistant are needed in case these disasters occur. The self-builders are not always aware of the building knowledge they need. Moreover, the residents often don't have the money to have done the needed structural adjustments. Cooperation between self-builders and social architects and structural engineers is also wanted, certainly in areas where the mentioned natural disasters can happen.

[3] See: Núñez León, J.A. and Zamoro Huancas, A.P. (2021) Identificación de los principales factores que influyeron en la decisión de construirse en AH 18 de Mayo, Piura. Universidad Nacional de Piura.

The College of Architects in Piura, through its president, considered that:
"The municipal services must exercise, monitor and evaluate permanent supervision. The population needs the protection of the authorities in order to be able to provide security in the event of an earthquake in this earthquake zone of the Piura region".[4]

The city and the region of Piura can face high seismic activities. During the years, many houses were built informally, often without the use of professionals, and sufficient municipal construction control. Therefore, many informally built homes can pose a serious risk to residents, especially if the homes are severely damaged during a strong quake. This means that data on housing quality in informal human settlements should be examined and linked to relevant data on the permanent earthquake risk. This could lead to three strategies:

- mapping non-earthquake-resistant homes, and setting up an action plan to improve these homes structurally;
- offering permanent housing supervision, conducting research, and evaluating housing policy to improve the homes in a planned manner.
- taking measures to be able to evacuate residents quickly in case it is really necessary.

Flooded street in 26th of October

Urban district of 26th of October in 2020

Roles of the provincial and district municipality

Municipal urban and infrastructure planning, and housing provision, are important public tasks, to create safe human sustainable communities with safe reliable housing. Municipalities have mostly had a role in making parceling plans, arranging the issuance of plots to families, and the registration of plots in the land registry, a process that has not yet been completed. Providing assistance to the public with technical control on the building site, is crucial in getting a safe construction. Technical assistance from government or NGOs can help to make homes safer. In the human settlements at risk, the residents must be alarmed as soon as possible. Local escape plans with routes are available in Piura.

[4] Correo Piura (17-06-2025) El decano del Colegio de Arquitectos de Piura señaló que más del 70% de viviendas están construidas de manera informal y sin supervisión de profesionales calificados y estarían en riesgo ante un fuerte sismo. El dio: "las construcciones informales en Piura son una bomba de tiempo".

The state of Peru has developed its own seismic warning system (SASPe), which includes the installation of a large number of sensors along the coastal zone, control centers in all regions, and horns in each district. This system warns the population in case of an earthquake, for up to 30 seconds. The president of the Geophysical Institute of Peru (IGP) has stated that: "when a seismic event occurs, the sensors that detect the earthquake have the property that they will immediately determine its magnitude and epicenter. And with that data, it is enough to give a warning that an earthquake has occurred, and that the seismic waves are advancing and can cause damage. With well-designed structures, the homes will best withstand a higher level of shaking".

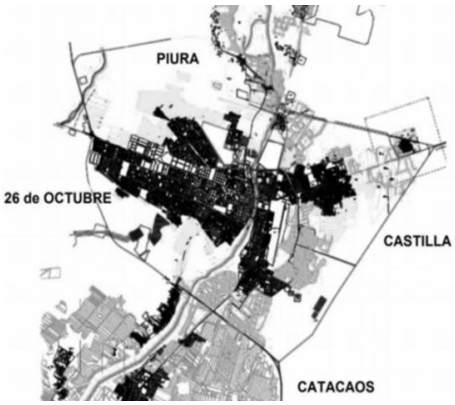
Megaproject Human Settlement of Piura

In order to eliminate the backlog of public works in the many AHs (human settlements) of Piura, large-scale civil engineering works are needed for drinking water supply and sewerage facilities and services of the residential areas, all together to service more than 466 thousand inhabitants in the three districts of Piura, Castilla and 26th of October, together with the district Catacaos forming Metropolitan Piura.

In these municipal districts, the number of AHs rose significantly. These are formal or informal residential areas, with their still existing backlogs in drinking water supply and sanitation, among other things. The national government, together with the regional government, and the municipal and district administrations, have adopted the "Human Settlements megaproject". On 30 May 2025, the Minister of Housing, Construction and Sanitation (MVCS) signed the contract with the "Castilla" consortium that will carry out the civil engineering works and infrastructures.

This megaproject, which includes 105 human settlements in the beneficiary districts, will install 7844 new household water connections, and another 7639 will be improved. Similarly, 7064 homes will have access to sewerage for the first time, while services will be improved for a further 13343 homes. In addition, 4 water reservoirs will be constructed and 280 km of water supply and 200 km of sewerage will be built. In order to improve and enlarged wastewater treatment, the Los Ejidos treatment plant (PTAR) is being built, and the Tacalá wastewater treatment plant is being renovated.

In 2024, The Ministry of Housing also signed a contract with the Agua Castilla Consortium, for the expansion of the Curumuy Drinking Water Treatment Plant (PTAP), which provides drinking water for the families within Piura's Human Settlements project. This will close the gaps in the drinking water supply and sewerage of the vulnerable families in the north of Peru.
The megaproject as a whole can be seen as a leap forwards to improving the quality of the residential environment of the AHs.



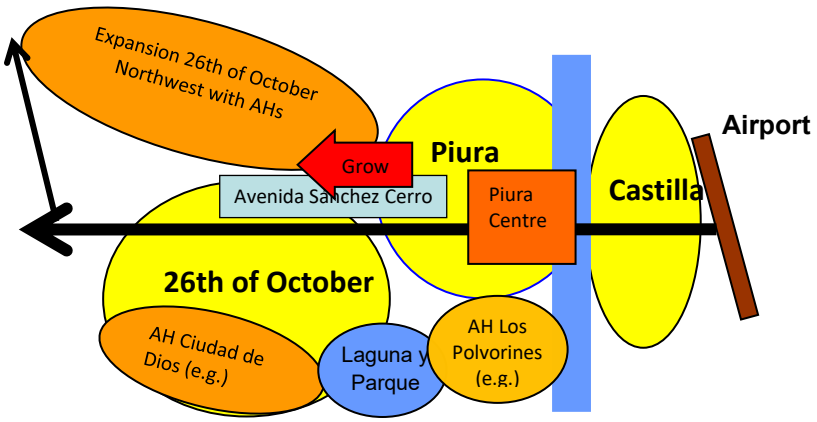
The four Districts of Piura in 2000

Planning in the district 26th of October

In the period 2000-2010, the municipality of Piura had devised the plan to designate a new area for human settlements on the southern edge (see indication 'AHs' on map below) with a capacity of 6,000 plots for self-help housing. As part of an evaluation of the then Piura-Castilla's "Plan Director", it was recommended in 2006 to carry out topographical research in the entire area south of the Avenida Sánchez Cerro, and to establish a 'red line' which should not be crossed with housing. The red line was not realized or maintained; meanwhile many dwellings have been informally constructed there by invasions. Current "Plan De Desarrollo Urbano De Los Distritos De Piura, Veintiséis De Octubre, Castilla Y Catacaos Al 2032", shows the growth of housing all around Piura and Castilla, with many human settlements.

The municipal district of 26th of October, covers subcenters such as the Urban Centre of San Martín, where the town hall is located; see the map at front page. The human settlements (AHs for short) and the older residential areas are both in a process of consolidation. The AHs discussed in this paper are: Ciudad de Dios, Los Polvorines, and Las Capullanas. The poorest AHs are mainly in the southern zone alongside the Carretera Panamericana Norte. The consolidated area is bordering the Avenida Sánches Cerro. In the zone alongside the Avenida, housing was densified and renovated, while the level of services and amenities rose significantly.

South of the Avenida Sánchez Cerro, in the district 26th of October, many human settlements were developed. The district is also home to the Kurt Beer Ecological Park, which is an area for recreation, education and eco-tourism. This park is the 'green lung' of Piura, 75 hectares in size. It has scenic quality, and there are: a pond, a wide variety of plants and trees, protected animals, a youth hostel, and sports and playing fields. The park and a large area around it are lower elevated than other parts of the city. Rainwater flows from this city to this area. This is also the case for some human settlements near the park, including Los Polvorinos, which was a flood plain in the rainy season.



Overview of the Districts of the City of Piura and global zoning (done in 2012 by Bredenoord)

1 AH Ciudad de Dios and surrounding.

Just after the year 2000 informal residential areas appeared in the 26th of October district, in the then desert-like landscape. The first houses were extremely simple, no more than shelters, which were improved as soon as it became possible for the residents to continue living there. The photos below show how low the housing quality was here. Over the years, the owners/residents have made many improvements. Today, many homes have stone walls and good roofs, and some have good architecture. The starting situation as shown below, was many times only the beginning of a long process of individual home improvement. Sometimes the public was sceptic about the poor development, but the authorities decided to organize the spatial organization, the basic infrastructures, and the land titling. Later, this way of organized self-build was embraced as an acceptable form of housing. In the 26th of October the different stages of growth can be found. Municipal guidance was given in preparing land for building, and providing a simple subdivision plan. Initially, the level of services was minimal. The construction of self-built homes was entirely left to the families and the consolidation period took a long time This method was amongst others used in the AH Ciudad de Dios, and other adjacent neighborhoods.

Informal settlements in 26th of October 2005. (Bredenoord)

2 AHs Las Capullanas and Micaela Bastides

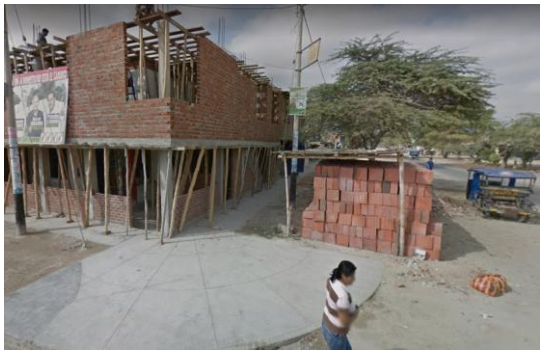
The AH Las Capullanas is located south of the Avenida Sánchez Cerro. Urban growth started here after 2000. The growth through the years is shown with images of the area near the mentioned road, taken in

2005, and later through images from Google Maps (2015). Considerable growth took place within the areas of the AHs Las Capullanas, Micaela Bastides 1 and 2, and San Martín, located opposite the road of the mayor market Las Capullanas. The market and surrounding commercial functions, have given a boost to the whole area which was developed on sandy soils from about 2000. The University César Vallego, and the townhall are all in the vicinity.

In 2024, the master's research of De la Cruz of the University César Vallejo (School of Architecture) analyzed the impact of self-built houses on urban architecture in Micaela Bastidas urbanization, bordering Las Capullanas, in accordance with the Sustainable Developments Goals (SDGG-11) for sustainable cities. Analyses were made of physical characteristics, visual coherence and aesthetic sustainability. The results indicate a lack of visual uniformity of the self-built houses, which does not benefit the urban architecture. Occasionally, there are practices of reusing materials and creating green spaces that make positive contributions to urban sustainability. The study highlights the need for urban policies that balance visual harmony and cultural identity, and highlights the potential of self-build to promote urban inclusion.

AH Micaela Bastides, and AH Las Capullanas, near the grand market. (Panamericana Norte is now Avenida Sánchez C.)

Street scene opposite Las Capullanas market in 2005 Avenida Justino Ramirez P.



Construction activities in Las Capullanas. Google Maps 2015

Street in Las Capullanas in 2015. Google Maps 2015

3 AH Los Polvorines

Los Polvorines is an example of a Peruvian human settlement that was created informally. In fact, the area should not have been built at all, because it was well known that the area was a flood plain in the rainy season. But this did not stop the invasions of people looking for a plot to build a home on. Essentially, the early built homes should have been transferred to a safer location. However, the settled families in Los Polvorines refused to move - despite the high risk of flooding - because they already had their homes and

small businesses there. Some measures had been taken, such as improving a drainage ditch. Yet the inundations kept coming, and (i.e.) the construction of a dike was considered. The NGO *Soluciones Prácticas* worked on an evacuation plan for Los Polvorines with its 3,000 households, and then a plan with escape routes was realized. But residents asked also for the betterment of services and facilities, such as more civil engineering measures to sidetrack the water in the time of flooding. The housing quality is still low, and some houses still have reed mats and bamboo. The municipal policy for the district accepts Los Polvorines as a medium density residential area, which is in fact formalized.

The municipality has drawn up a safety plan to give residents escape routes in the event of flooding. The evacuation area contains a drainage canal, over which escape routes with bridges of (i.e.) bamboo have been laid. Soluciones Practicas worked on the design of the urban development plan of the settlement Los Polvorines.

Escape routes for residents Las Polvorines in case of flooding.

Floodded human setllement in Piura.

Source: Soluciones Prácticas. Map by INDECI, 2015.

EVALUATION

De City of Piura has a plan for the future to improve the environmental quality of the informal settlements. The population concerned may be relocated to safe areas designated for northwest urban expansion area of the 26th of October. The restoration of areas for ecological protection with safety margins is pursued, which has consequences for Park Kurt Beer, which is now surrounded by several AHs.

The development plan of the city of Piura also consists of relocating the population of various human settlements that do not have basic facilities, towards the planned municipal expansion area. The City of Piura will promote training in the use of appropriate materials and building systems, aimed at the self-construction of their homes.

The following conclusions are drawn.

- In the municipal districts of Piura and 26th of October, public housing policy is closely intertwined with the choice to expand the city in a westerly direction.
- Between 2000 and 2020, the city was expanded in a southwesterly direction. Around 2010, the city was also expanded into a northwesterly direction. The expansion process is still ongoing here, and there is still space for future urban expansion.
- The expansion plans from 2000 onwards were guided by the city of Piura. They designed rectangular allotment plans, usually with small plots for the benefit of self-building families.
- The human settlements discussed in this paper were probably still informal at the outset, but the current impression is that the later AHs were established according to strict municipal plans and housing regulations.
- In Los Polvorines and its surroundings, the inhabitants were confronted with flooding during the rainy season, which caused damage to their homes. The municipality wants to prevent these situations from arising again. These problems are less prevalent in the northwestern side of Piura/26th of October.
- The combination of the self-build housing by families/owners on the one hand, and municipal spatial planning on the other, has proven successful in Piura.
- The housing quality of the AHs realized has been discussed several times. At the moment, there is no clear picture of the actual situation. One recommendation is to investigate the quality of the housing in order to determine what technical assistance is needed for self-builders.

Comparison Piura/26th of October with three suburbs of Lima.

The three land-for-housing projects mentioned below, are now large suburbs of the Lima metropolis, which were developed by a more or less orderly urban development plans, allowing for the allocation of individual plots to low-income families. The principles of self-help housing and assisted self-help housing were used here.

1. ***Municipality of Villa el Salvador, Lima, Peru.***
   The current major challenge for VES is how to densify the urban area, to accommodate part of the growth of the urban population of Greater Lima.
2. ***Self-reliant urban community of Huaycán, municipality of Ate, Peru.***
   The current major challenge facing Huaycán is how to make the informal developments on the mountain slopes surrounding Huaycán safe, and integrate them with the 'old' planned Huaycán.
3. ***Pilot project New Pachacútec, municipality of Ventanilla, Peru.***
   The current major challenge for Nuevo Pachacútec is how to improve Pachacútec's informal housing as a whole, making it resilient to the strong earthquakes that can occur in the area.
4. ***Self-constructed homes in the city of Piura/26th of October, Peru.***
   Mayor challenge for Piura/26th of October is investigating housing qualities of self-help housing areas. New planned suburban areas are available for self-building of homes. Earthquakes and floods must be taken into account.

EPILOGUE

The comparison of Piura with the three municipalities within metropolitan Lima, shows that in all cases, self-construction of homes by families was combined with governmental assistance, local or regional, including land management, designs for expansion plans, and controlled issuance and registration of land properties. Public housing finance is available in the country, such as subsidies and subsidized loans for new homes and renovations. In international literature on public housing, the described housing provision system is often called “Assisted Self-help housing”, or: “Incremental housing”.

In **VES**, territorial urban expansion is no longer possible, which means that architectural solutions must be found for housing densification.
In **Huaycán**, the construction of homes on the mountain slopes is a problem. Housing development there is illegal. Technical problems are being sought to make homes on the mountain slopes safe and accessible.
In **Pachacútec**, it is necessary to improve the quality of housing, among other things to be able to reduce the risk of collapse in the event of earthquakes.
In **Piura**, there is no shortage of land for urban expansion, but the quality of housing in the many new residential areas is not optimal. Housing in flood areas must be prevented.

The author was unable to finish his research in Piura/26th of October on time, due to the corona epidemic, among other things. The comparison shows that housing quality is a focus area in all four municipalities studied. Further research is required. Additional research into solutions is desirable, among them organized technical assistance for self-builders. The author has herewith updated a document, which was already written in 2015, in order to make a comparison with three self-build suburbs of Lima. It must be regarded as an informative document, which may be used only for educational purposes.

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