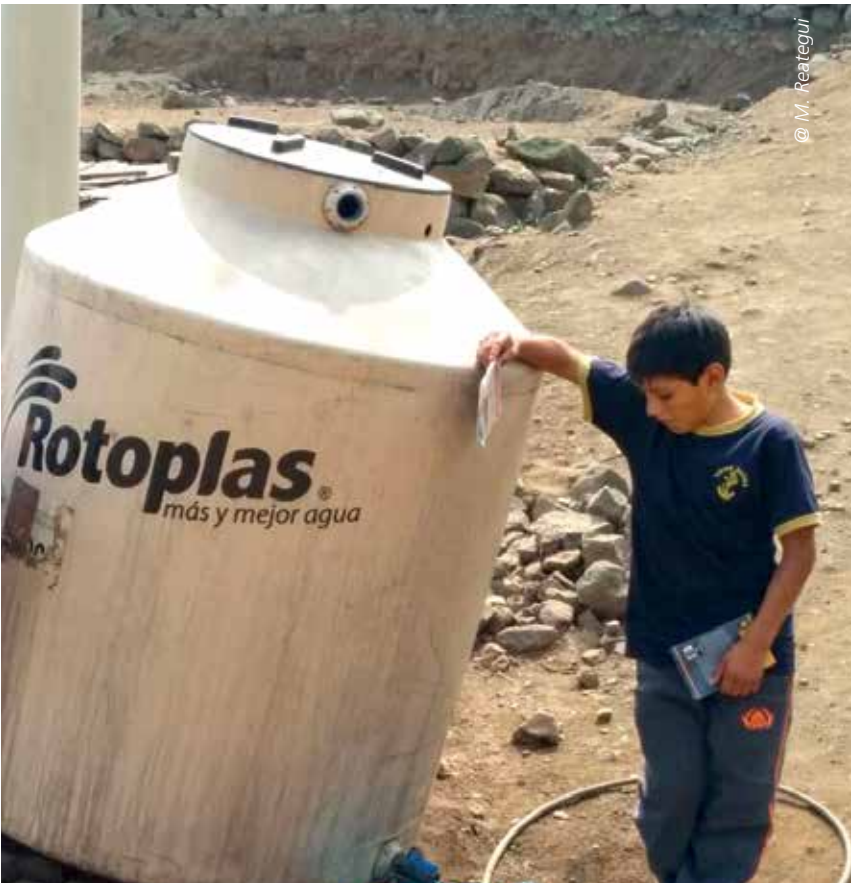
Building Financial Resilient Neighborhoods

The Case of José Carlos Mariátegui, Lima, Peru



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Building Financial Resilient Neighborhoods:
The Case of José Carlos Mariátegui in Lima, Peru

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[1]This report integrates findings from an earlier study led by Marco Kamiya, head of Urban Economy and Finance Branch at UN-Habitat, and Juan Luis Arango, consultant with the Urban Economy and Finance Branch. That study was commissioned by University College London for the climasinRiesgo project (CLIMA). The report was considerable strengthened by Luis Miguel Triveño, specialist in urban resilience, housing and disaster risk management at the World Bank. The authors also wish to thank Richard Walker for editorial support.

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[3]Thanks for major comments to Adriana Allen, CLIMA's project Director, professor at UCL, Liz Paterson, Christophe Lalande, Fernanda Lonardoni, Laura Petrella, Liliana Miranda, Rita Lambert, Matthias Nohn, Kerstin Sommer, Carlos Escalante, Teresa Belkow, with all disclaimers applied. The views expressed in this paper are those of the authors and do not necessarily reflect the official policy or position of UN-Habitat, World Bank or University College London.

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Acronyms

CLIMA: climasinRiesgo Project

COFOPRI: Organismo de Formalización de la Propiedad Informal [Organization for the Formalization of Informal Property]

PROLIMA: Programa Municipal para la Recuperación del Centro Histórico de Lima [Municipal Program for the Renewal of the Historic Center of Lima]

SCC: Saving and Credit Cooperatives

SEDAPAL: Servicio de Agua Potable y Alcantarillado de Lima [Potable Water and Sewage Service of Lima]

1. INTRODUCTION

The supply of affordable and adequate housing has been overwhelmed by the demand of the millions of rural poor who have migrated to cities in hope of finding better employment, health care, and better educational opportunities. According to UN estimates, the urban population of the developing world alone will increase from 2.7 billion in the year 2011 to 5.1 billion by 2050. To accommodate the more than 2 billion new arrivals, the urban footprint of cities in the developing world is expected to double by 2030—and triple by 2050.[4] This rapid increase in both urban population and the physical size of cities implies a pressing need for housing and land. According to Reinhard Goethert of the MIT School of Architecture, "We have 20 years to build as much urban housing as was built in the past 6,000 years."[5] This is a challenge that will require an approach that is completely unprecedented in terms of scale and speed.

The current demand for housing stands at 1 billion new homes worldwide by 2025, at a cost of $650 billion per year.[6] Because governments have failed to ensure that the supply of affordable and legal housing kept pace with demand, newcomers have had few alternatives but to informally occupy government and private land in cities and to use their savings to begin a process of incremental self-building. Incremental housing can thus be defined as shelter resulting from a gradual, step-by-step process in which building structures are appended or improved by owner-builders as funding, time, or materials become available. While in rare cases the financial resources of households have been supplemented by short-term credit from microfinance institutions and suppliers of building materials, the overwhelming majority of self-help, pay-as-you-go building is dependent solely on the savings of households and communities.

As in most cities across the Global South, Lima suffers from risk traps—the combination of biological, physical, and socioeconomic conditions that makes a population vulnerable to economic setbacks or physical harm.[7] Risk traps have severe impacts on the everyday lives, livelihoods, and assets of the urban poor as well as the city's ecological and socioeconomic future. While the specific ways in which everyday hazards and episodic, small-scale disasters accumulate to produce urban risk traps are still poorly understood by scholars and policymakers, it is clear that the prevalence of substandard housing increases the vulnerability of the approximately 1 billion people worldwide who live in slums or informal settlements. The number of slum dwellers in the developing world has experienced a 28 percent increase over the past 14 years and is expected to reach 2.5 billion by 2020. Not surprisingly, the quantitative housing deficit the urban poor face is compounded by an even greater qualitative deficit: In 2010, around 980 million urban households lacked some or all of the amenities that define adequate housing, including access to clean water, improved sanitation, sufficient living space, structural quality, and security of tenure. Today, much of the world's affordable housing is inadequate, while most of its adequate housing remains unaffordable for the urban poor.

In this paper we analyse the case of José Carlos Mariátegui, a neighbourhood located in the periphery of Lima that faces challenges from unplanned development and rapid growth. ClimasinRiesgo (CLIMA), a project launched by the Development Planning Unit of the University College London (UCL) and supported by the Urban Economy Branch of UN-Habitat, aims to help improve the living conditions of neighbourhoods such as José Carlos Mariátegui by (1) identifying the variables that produce risk traps for vulnerable inhabitants, and (2) developing effective and equitable strategies to mitigate or prevent risk traps.[8] Improving access to housing with minimal quality standards is a major challenge in José Carlos Mariátegui, so this report focuses on the financial challenges of providing adequate housing in a way that is sustainable for investors and inhabitants alike.[9] The financing alternatives explored in this paper include subsidized down payments and interest rates; incremental upgrades (through loans based on the repayment capacity of the households); and community mortgages. The financial scheme proposed in this study covers the five main requirements for safe and resilient housing: plot acquisition, titling, land levelling, housing unit structure, and public services. The cost of housing improvements was estimated by taking into account actual housing conditions, while estimates of households' ability to pay for improvements was based on the actual socioeconomic conditions of the residents. Within this framework, there is space for interventions from both the private and the public sectors.

Current demand for housing stands at 1 billion new homes worldwide by 2025, at a cost of $650 billion per year.

[4]Angel, S. et al. "The dimensions of global urban expansion: Estimates and projections for all countries, 2000-2050". Progress in Planning 75, no. 2, pp. 53-107.

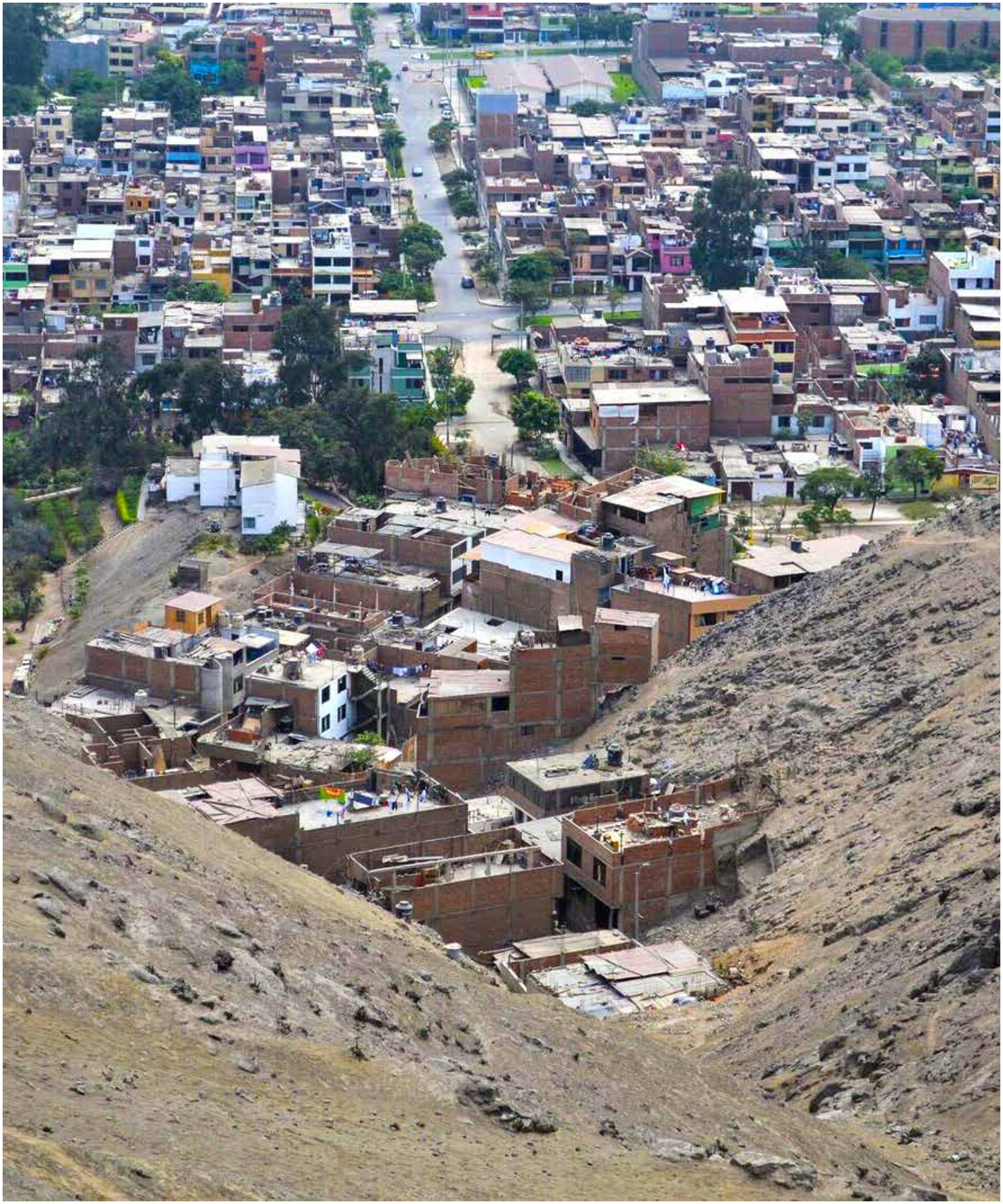
[5]Goethert, R. "Incremental housing: A proactive urban strategy". Monday Developments. September 2010. Available from web.mit.edu/incrementalhousing/articlesPhotographs/pdfs/PagesMondayMag.pdf.

[6]Woetzel, J. et al. "Tackling the world's affordable housing challenge". McKinsey Global Report. October 2014. Available from https://www.mckinsey.com/global-themes/urbanization/tackling-the-worlds-affordable-housing-challenge.

[7]The idea of a risk trap is similar to the economic concept of a poverty trap, in which persistent and self-reinforcing conditions (such as lack of access to education, credit, or health care) inhibit people from rising out of poverty.

[8]More information about CLIMA is available on its website: www.climasinriesgo.net/.

[9]According to the McKinsey Global Institute, over 96 million urban households are financially overstretched, 235 million urban households live in substandard housing, and by 2025 106 million additional low-income households will face an affordable housing challenge. See Woetzel, J., et al. (2014).



View of Mangomarca in the district San Juan de Lurigancho @T. Belkow

2. CONTEXT

2.1. The Challenge of Physical and Legal Vulnerability of Housing

Over the past decade, there has been a fair amount of progress in reducing the percentage of urban dwellers in Latin America and the Caribbean (LAC) who live in slums. (See Table 1). Yet according to a 2012 study by the Inter-American Development Bank, roughly a third of families in the LAC region "live in dwellings that are either unsuitable for habitation or were built with poor materials and lack basic infrastructure services."[10] Among individual countries, the landscape is varied, with countries such as Nicaragua, Bolivia, and Peru facing housing deficits more than double the regional average (at 78 percent, 75 percent, and 72 percent, respectively). Meanwhile, countries such as Brazil and Colombia and in Central America have closed the gap on quantitative deficits but still need to bridge important qualitative shortages, including dwellings with no legal titles, walls made from discarded materials such as cardboard, dirt floors, and lacking access to potable water and sewage systems.

Table 1: Percentage of people living in slums in Latin America

Country	2005	2014
Argentina	26.2	16.7
Bolivia	50.4	43.5
Brazil	29.0	22.3
Colombia	17.9	13.1
Costarica	10.9	5.5
Dominican Republic	17.6	12.1
Ecuador	21.5	36.0
Guatemala	42.9	34.5
Haiti	70.1	74.4
Honduras	34.9	27.5
Mexico	14.4	11.1
Panama	23.0	25.8
Peru	36.1	34.2
Latin America & Caribbean	**25.4**	**20.5**

Source: UN-Habitat

The high vulnerability of informal housing to natural disasters underscores the importance of investing in better-built new homes and retrofitting existing ones, including those built incrementally by families. Housing in many LAC countries is particularly vulnerable to seismic activity. In the aftermath of the 7.0-magnitude earthquake that struck Haiti in 2010, more than 40 percent of private-asset losses were related to housing. If a country like Peru were to be hit by an 8.0-magnitude earthquake, an estimated 80 percent of potential economic losses would involve housing. In the 22-year period between 1990 and 2011, losses in the housing sector for 16 countries in LAC were estimated to be at least $53 billion. Fifty-four percent of homes destroyed during this same period were destroyed by seismic events, with the majority of these losses occurring in El Salvador, Colombia, and Peru. Other regions of the world have also experienced important losses in the housing sector due to earthquakes: Over half a million homes were destroyed by the two major earthquakes in Nepal in April and May 2015, and more than six million homes (860,000 of which were in urban areas) were destroyed or significantly damaged by the 8.0-magnitude earthquake in China's Sichuan Province in 2008.

In the 22-year period between 1990 and 2011, minimum losses in the housing sector for 16 countries in LAC were estimated to be $53 billion.

Construction practices prioritize economy over security. The result is a pool housing units that is highly vulnerable to various hazards.

In the developing world, the vulnerability of housing to earthquakes is greatly amplified by the informal nature of much of the housing stock and its location (for example, when houses are built in geologically unstable areas where construction is not recommended). These informal or substandard housing units have generally been built without architectural and engineering input and without taking into consideration potential geologic hazards such as landslides, floods, or earthquakes. Building codes, when they exist, are rarely enforced.

Construction practices for informal housing tend to prioritize economic over security concerns. The result is a pool of housing units that is highly vulnerable to various hazards. Given that no government in the developing world could afford to subsidize or outsource the construction of enough new housing units to meet current demand, self-construction is the only realistic way that many urban residents can get a roof (safe or not) over their heads. Thus, in Peru as elsewhere in the developing world, the challenge is how to create strong enough incentives so that the vast sums of money that households are investing in incremental building—an combined

[10] Inter-American Development Bank. "Latin America and the Caribbean face large and growing housing deficit, IDB study says". May 14, 2012. Available from www.iadb.org/en/news/news-releases/2012-05-14/housing-deficit-in-latin-america-and-caribbean,9978.html.

$84 billion a year in Colombia, Guatemala, Mexico, and Peru—results in housing that is more resilient to natural disasters and improves living conditions in urban neighbourhoods, particularly in the many slums that are being created by rapid and unplanned urbanization.[11]

2.2 Finding Slums in Lima

Using cartographic and block-level data from Peru's 2007 Population and Housing Census, Emilio Matuk and Luis Triveño designed a housing vulnerability index based on 200 physical and socioeconomic attributes for 6,958 neighbourhoods in Lima, Peru (84 percent of the total).[12]

In order to identify Lima's slums, Matuk and Triveño examined several characteristics, including the physical characteristics of existing housing stock and the socioeconomic conditions of the inhabitants, that diverged sharply from other neighbourhoods nearby. The variables examined included:

- Composition of the dwellings' flooring
- Characteristics of the dwellings' sewage system
- Legal status of the dwellings' plot tenure
- Household crowding (persons per bedroom)
- Household total number of (recent) births
- Household members' age structure
- Household members' educational achievement
- Household members' employment status
- Number of adults in household who possess a government-issued ID
- Mother tongue of each household member over the age of five

Figure 1: Boroughs in Metropolitan Lima

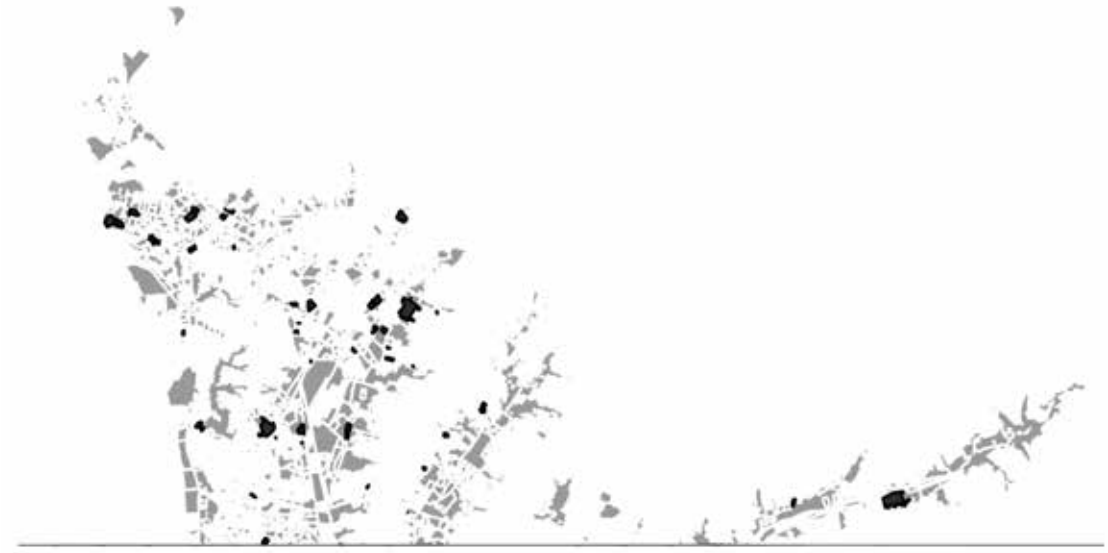
Source: Matuk, E., and L. Triveño (2017).

[11] Endo, Triveño, and Alarco propose combining the promise of formalization of informal construction with a structural risk-mitigating housing program and financial support—either via government subsidies or microloans—to improve the physical and legal vulnerability of the housing stock in Latin America. See V. Endo, L. Triveño, and A. Alarco (2017).

[12] See Matuk, E., and L. Triveño (2017).

Matuk and Triveño identified two variables that appear to strongly predict the existence of slums: the lack of piped sewerage and a high number of (recent) births. None of the other variables were statistically significant. Figure 2 shows the location of slums in the outskirts of Lima: 90 percent of the households in these 65 neighbourhoods lacked both piped sewerage and had more than three children. But slums exist not just in Lima's periphery. Figure 3 shows the 148 slums located in the inner areas of the city, where more than 90 percent of households contained more than three children and where the built-area is also very dense (that is, the neighbourhoods exhibit high levels of internal and external density).

Figure 2: Slums on the outskirts of Metropolitan Lima



Source: Matuk, E., and L. Triveño (2017).

Figure 3: Slums in inner Metropolitan Lima

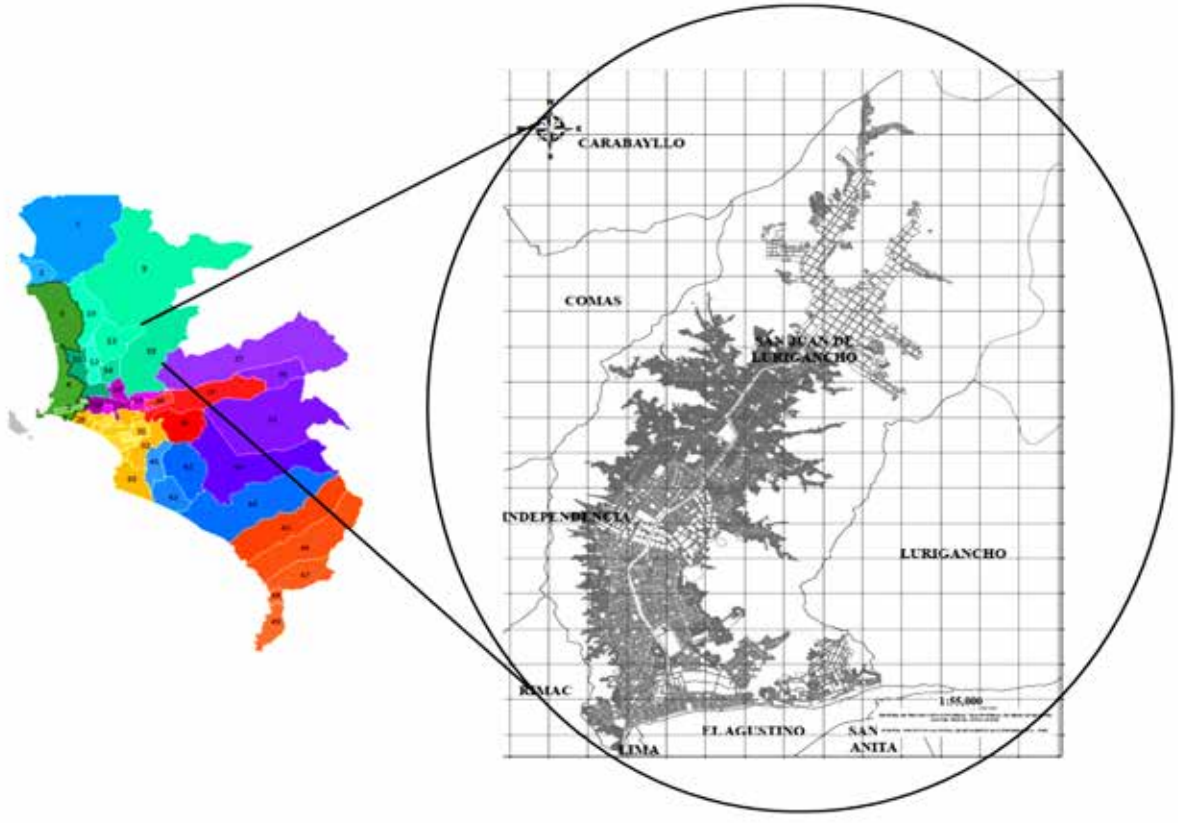
Source: Matuk, E., and L. Triveño (2017).

2.3 José Carlos Mariátegui

José Carlos Mariátegui is a neighbourhood situated in the San Juan de Lurigancho district of Lima. (See Figure 4.) Located at the northeast part of Lima, the San Juan de Lurigancho district is 131.25 square kilometres in size and has a population of over 1.1 million, according to a 2016 estimate by the Peru's National Institute of Statistics and Informatics. As one of the poorest and most populous districts in Lima, San Juan de Lurigancho contains several informal settlements, or pueblos jóvenes. Since the late 1990s, waves of land-grabbing have occurred along the dry and steep ravines of the district, initially through collective land invasions (in which land traffickers instigate a "mass invasion" of an area where the police or politicians lack the means or incentives to remove them all at once) and more recently through the informal subdivisions of land driven by a lack of affordable housing and land elsewhere in the city. Housing informality and land-grabbing are thus intertwined in a backward process of urbanization in which land tenure security is obtained only after the occupant has claimed residency in the area.

José Carlos Mariátegui's location along the steep slopes of a mountain, along with decades of unplanned and rapid growth, presents several challenges to the building of resilient housing. The neighbourhood is dramatically underserved in terms of public utilities and lacks basic infrastructure. The area's complex history of land acquisitions and settlements, together with the substandard quality of building construction, creates risks and hazards that have only intensified over time.

Figure 4: San Juan de Lurigancho's location in Lima

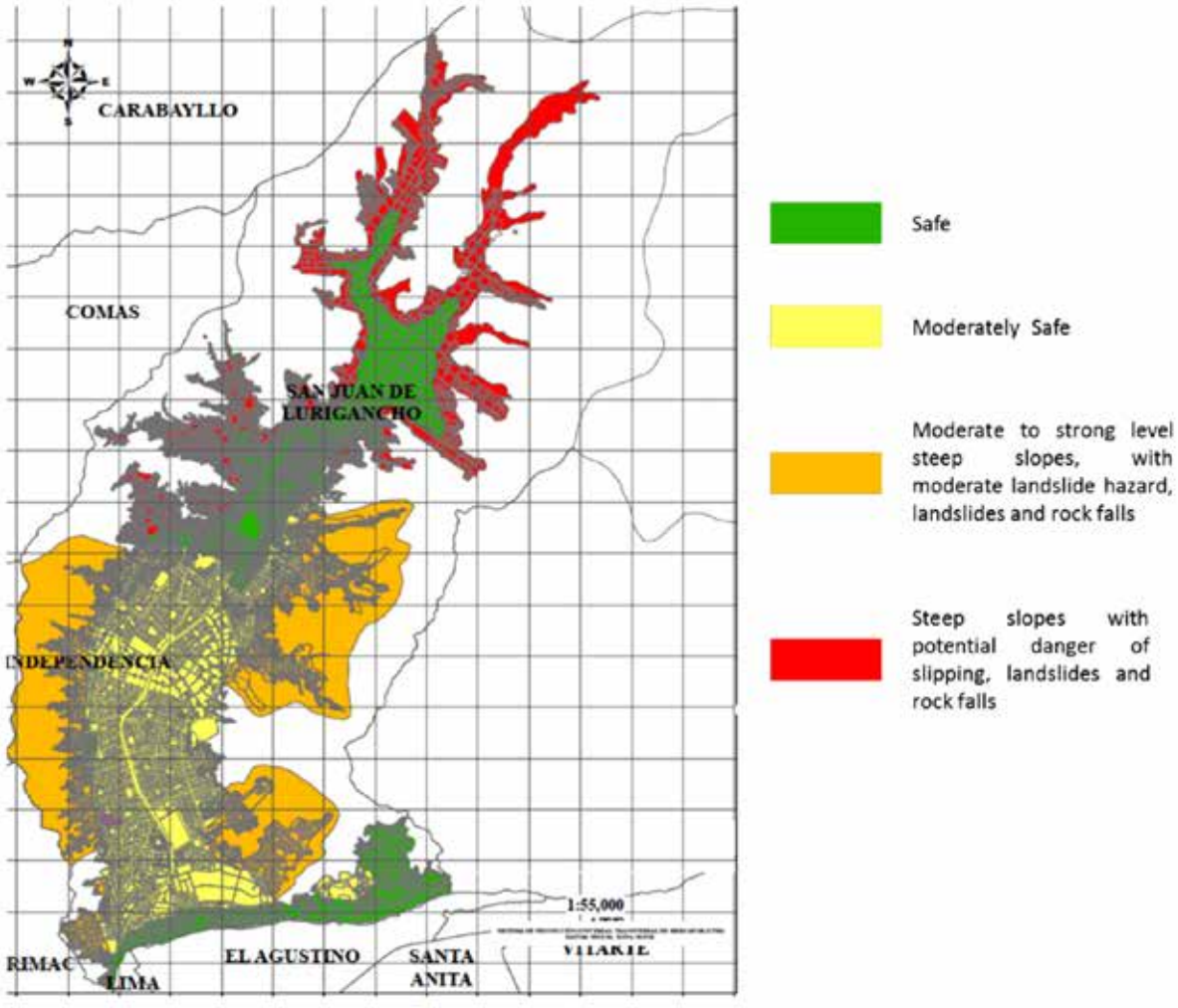


Source: Based on information from Wikipedia and PROLIMA.

Even though San Juan de Lurigancho is Lima's most populous district, a large portion of its territory is not suitable for human settlement due to the risk of floods, landslides, rock falls, and other natural disasters. It would thus require large-scale resettlement to fully mitigate these physical risks. Figure 2 shows the level of earthquake risk in the different areas San Juan de Lurigancho based on geological and geophysical characteristics, such as soil type and slope of the land. The José Carlos Mariátegui neighbourhood, shown in Figure 6, is located in some of San Juan de Lurigancho's highest risk areas, where steep slopes present a potential danger for slipping, landslides, and rock falls. Because of these risks, the urban infrastructure and quality of housing construction in José Carlos Mariátegui will be a key component of any effort to mitigate existing hazards.

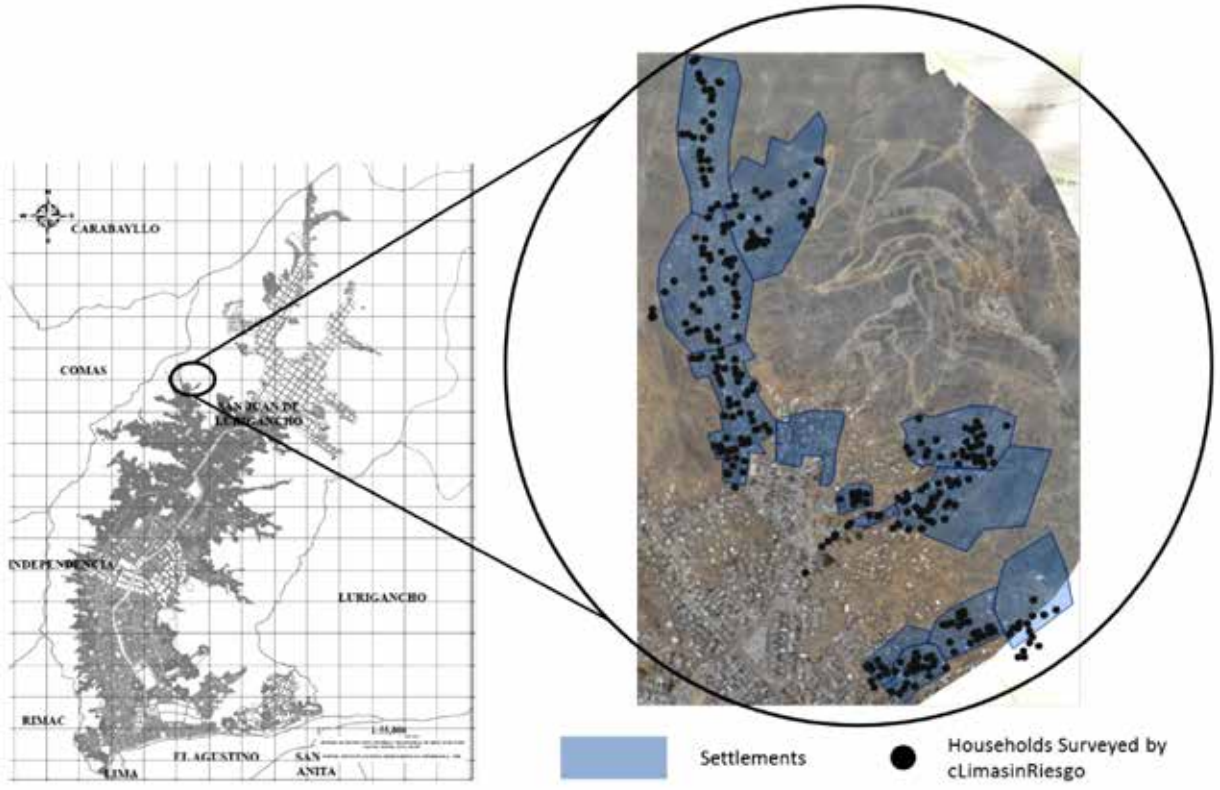
A complex web of land acquisition, and accumulation of construction risks accumulate and intensify over time.

Figure 5: Seismic microzoning of San Juan de Lurigancho



Source: Based on analysis and data from PROLIMA.

Figure 6 Location of CLIMA's survey sites in José Carlos Mariátegui



Source: Based on data from PROLIMA and CLIMA.

Informality and land grabbing are intertwined by a backward process of urbanization where certain land tenure security is obtained after a while by claiming residency in the area.

2.3.1. Legal Context

José Carlos Mariátegui is located in an area of the San Juan de Lurigancho district that was part of an Andean peasant community, or comunidad campesina, a community that has historically been vulnerable to exploitation by land traffickers and that has often been neglected by slum leaders and community chiefs. This is a common situation in Peru, as well as in other countries in Latin America, where a lack of property rights affects native and peasant communities in both urban and rural areas. The number of peasant communities in Peru ranges from 3,029 to 6,120, depending on the source. However, not all of them possess land titles, as shown in Figure 6.

Figure 6: Peasant communities and land titles

Number of peasant communities according to different organizations

COFOPRI (2010)	Ministerio de Cultura (2016)	CENAGRO (2012)	Instituto del Bien Común (2016)	Direcciones Regionales Agrarias (2013)
6,069	3,029	6,277	6,120	4,359

Number of peasant communities with land titles according to different organizations

COFOPRI (2010)	SUNARP (2010)	Direcciones Regionales Agrarias (2013)	Instituto del Bien Común (2016)	CENAGRO (2012)
5,110	7,147	3,400	5,097	4,160

Due to the different legal layers that govern the plots of land on which dwellings have been established in José Carlos Mariátegui, the legal status of specific plots is often unclear, especially when the plots come from land traffickers. Nevertheless, as shown in Figure 7, roughly four-fifths of the 322 households surveyed by CLIMA possess some kind of certification of their occupancy. By far the most common is the "proof of possession" certificate, which 56 percent of surveyed households possessed. Only 46 households (14 percent) have property titles that formally recognize their legal ownership of their properties. Yet the most important question is whether property rights could ever really be regularized in José Carlos Mariátegui, considering that so much of its housing is located in a hazard area not suitable for residential buildings.

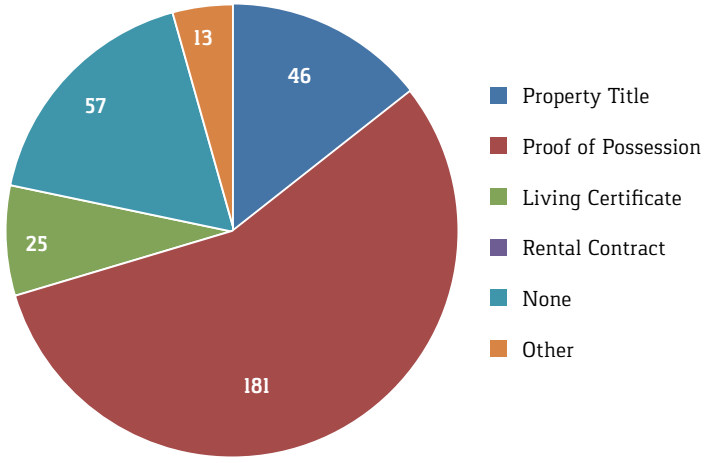
The several kinds of property documentation include:

- **Property title (titulo de propiedad)** is a document that accredits a person as the legal owner of a property. It specifies the date and manner in which the property was acquired and describes the physical characteristics of the property, including its location, size, etc. Because it is proof of legitimate ownership of the property, the property title protects the owner's legal and economic interest in the property against any competing claims.

- **Proof of possession (constancia de posesión)** is a certificate granted by the municipality to the occupant of a dwelling. Its sole purpose is to allow informal settlers to access basic public services. Granting of a proof of possession certificate does not, by itself, affect the property rights of the property owner. By law, the government is required to notify the legal owner when a proof of possession certificate has been requested for a property. In practice, however, this does not always happen quickly or even at all, meaning that the proof of possession certification can be issued without the owner's awareness. When legal owners try to dispose of the property or are involved in a dispute, they may only find out then that a proof of possession certificate had been issued to the informal dweller. For informal settlers, proof of possession can be useful in asserting an ownership claim over a property after they have occupied it for a year or more.

- **Living certificate (certificado de vivencia)** is a document issued by the municipality that states that a person has been living at a certain place for a certain period of time. It cannot be used in lieu of the proof of possession certification for accessing public services. If the government decides to transfer ownership of a piece of property, the living certificate—like proof of possession—provides proof that the informal settler has been using the property and strengthens his or her claim to it.

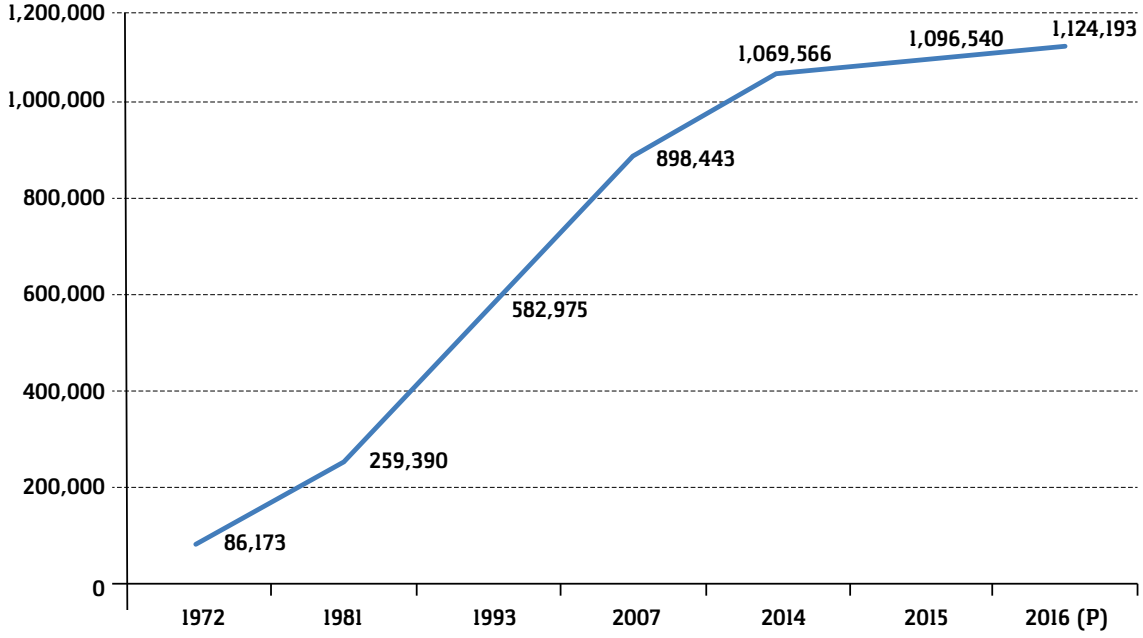
Figure 7: Property documentation for households in José Carlos Mariátegui



Source: Based on CLIMA's survey of households.

As shown in Figure 8, the population of San Juan de Lurigancho, where José Carlos Mariátegui is located, grew at a rate of over 2.5 percent a year from 2007 to 2014. In 2016, it was estimated to be home to over 1.1 million inhabitants. This rapid population growth has pushed the institutions of the municipality to their limits, which is why they have not been able to stop the urban sprawl in areas such as José Carlos Mariátegui—or to mitigate the risk traps that the area's residents face on a daily basis.

Figure 8: Population of San Juan de Lurigancho, 1972–2016

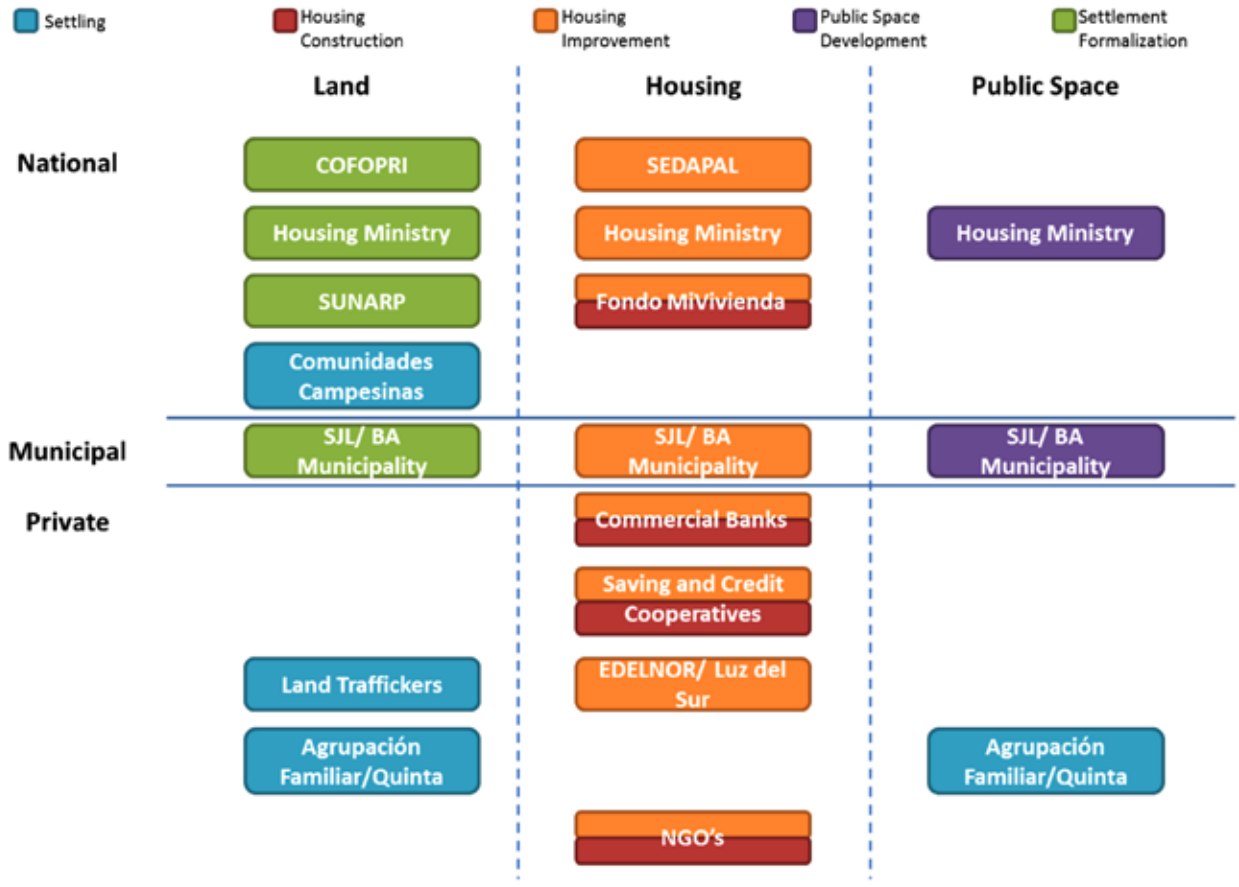


Source: Based on data from Municipalidad Distrital de San Juan de Lurigancho.

3. Housing and Resilience Ecosystem

A considerable number of institutions make up the institutional ecosystem for housing in Lima (and in Peru in general). These institutions are identified in Figure 9, grouped by their legal status and role. An explanation of each is provided below.

Figure 9: Institutional ecosystem for housing in Lima



Source: Authors

3.1 National Government

- **Organization for the Formalization of Informal Property (Organismo de Formalización de la Propiedad Informal, or COFOPRI)** is a decentralized public institution within Peru's Ministry of Housing, Construction, and Sanitation. It is responsible for carrying out the legal and physical formalization of informal possessions, rural land, uncultivated land, rural communities, and properties of public and private entities at the national level.

- **Ministry of Housing, Construction, and Sanitation (Ministerio de Vivienda, Construcción y Saneamiento)** is the lead national agency for improving the living conditions of the Peruvian population by facilitating their access to adequate housing and basic services, such as water and sanitation. The agency designs, regulates, promotes, monitors, evaluates, and implements national-level policy for the housing sector and contributes to the competitiveness and sustainable territorial development of the country.

- **Fondo Mivivienda S.A.** was established by Peruvian law in 2006 to finance the acquisition and improvement of housing and housing construction for the most vulnerable segments of the population. The fund has a variety of programs, such as Mivivienda, Miconstrucción, Techo Propio, and Mismateriales, among others, that promote the provision of basic services, such as electricity, water, and sanitation. Fondo Mivivienda is part of the Ministry of Housing, Construction, and Sanitation and is supervised by the Superintendence of Banking and Insurance.

- **Superintendence of Public Registries (Superintendencia Nacional de los Registros Públicos, or SUNARP)** was created in 1994 as an autonomous agency to oversee the National Public Registry System. Its primary function is to devise technical and administrative policies and rules for the public registries as well as to plan, organize, regulate, direct, coordinate, and supervise the registration and publication of deeds and contracts filed in the registries throughout Peru.

- **Peasant communities (comunidades campesinas)** are public interest organizations with legal status, consisting of families linked by ancestral, social, economic, and cultural ties that are reflected in the communal ownership of land, communal work, mutual help, democratic governance, and the development of multi-sectorial activities. Peasant communities were conceived to promote the improvement of living conditions for whole communities as opposed to individuals. The first peasant communities were established in 1987, with the aim of preserving the cultural heritage of communities with a strong link to the land they inhabited. In 1993, after a new constitution was drafted, the laws regulating peasant communities were modified. Peasant communities were recognized as legally autonomous organizations, and the land where communities were established could be traded. New laws in 1995 granted even more autonomy to the peasant communities. The laws provided several options for peasant communities to dispose of their land, including taking out a mortgage with the land as collateral, leasing the land, or selling the land to third parties (which is the most common outcome). The complexity of the issue and the lack of holistic regulations have led to legal ambiguity.

- **Potable Water and Sewage Service of Lima (Servicio de Agua Potable y Alcantarillado de Lima, or SEDAPAL)** is the state-owned water company responsible for providing potable water and sanitation services to the residents of Lima and the neighbouring city of Callao.

3.2 Municipal Government

- **Municipality of San Juan de Lurigancho** is responsible for a variety of matters concerning local development. The most relevant responsibilities include determining land use within San Juan de Lurigancho, overseeing the process for regularizing and formalizing the legal possession of property (saneamiento fisico legal de los asentamientos humanos), and providing local services such as solid waste management, transit, etc.

3.3 Private Sector

- **Saving and Credit Cooperatives (SCCs)** are jointly owned companies that are created on a free and voluntary basis in order to meet the financial, social, and cultural needs of its members. SCCs promote savings in a variety of forms and provide other financial services to its members. They are a mutual solidarity alternative for those who do not have access to the traditional financial system. The savings of SCC members are used to create a common fund in order to provide credit to individual members at favourable rates.

- **Land Traffickers** are organizations that attempt to take control of property through violence or other illegal means. Once they control the property and have settled on it for a period of time, they sell the property using fake documents. In San Juan de Lurigancho—and especially in José Carlos Mariátegui—they often attempt to take over land belonging to peasant communities. Sometimes this takeover is through violent means, but sometimes it is done through direct negotiations with the leaders of the peasant communities.

- **EDELNOR and Luz del Sur** are private companies in charge of providing electricity to Lima and other regions of Peru.

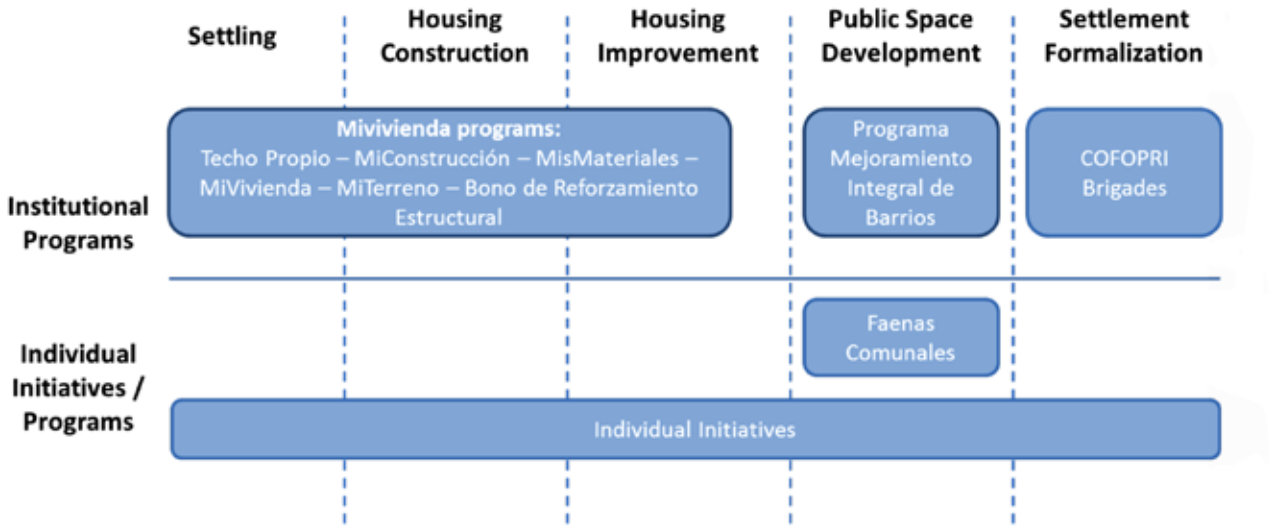
- **Agrupaciones familiares (family groups)** are legally recognized organizations based around internal councils that are in charge of dealing with specific issues faced by the community. Agrupaciones familiares are not necessarily strictly groups of families, however. Of the 12 different agrupaciones familiares surveyed by CLIMA, the average agrupación familiar consisted of 92 houses (the smallest consisted of 16 houses while the largest consisted of 170 houses). One of the main reasons that communities form an agrupación familiar is because public services companies sometimes require it before they will install the service. Another main objective is to gather households together so that they can contribute the money and labour necessary for building or upgrading common areas (for example, stairs to access the houses) and public spaces such as playgrounds and parks.

- **Quinta** is a set of houses built on a lot for the exclusive use of its occupants and is accessible by a common area or directly from the street. This is one of the most common ways of living in Lima's Barrios Altos neighbourhood.

- **Nongovernmental organizations (NGOs)** are involved in the housing upgrade process in Lima. Two of the more prominent ones are the Institute of Urban Development (El Instituto de Desarrollo Urbano, or CENCA) and the Association of Sustainable Development for Urban and Rural Peoples (Asociacion of Desarrollo Sostenible para los Pueblos Urbanos y Rurales, or ADSOPUR). The NGOs specialize in areas such as urban planning, habitat improvement, gender equality, and the environment. In San Juan de Lurigancho, some NGOs are involved in providing safe transitional housing for people who have become homeless or building retaining walls for houses vulnerable to rock falls and landslides.

It is also worth noting that many institutional programs and private initiatives supplement the efforts of Lima's institutional housing ecosystem. The programs identified as having the most significant impact on Lima's housing upgrade process are shown in Figure 10. An explanation of each of them can be found below.

Figure 10: Housing-related programs in Lima



Source: Authors

3.4 Institutional Programs

- **Mivivienda programs:** As described above, Fondo Mivivienda has a variety of programs for helping Peru's lower-income families afford adequate housing. The programs are designed to help people buy land (Miterreno), build a house (Miconstrucción and Techo Propio), buy a house (Mivivienda and Techo Propio), buy the materials necessary to build or upgrade a housing unit (MisMateriales), or to structurally reinforce a dwelling to make it less vulnerable to earthquakes (Bono de Reforzamiento Estructural). Each of these programs provide loans that the recipient must repay (except for the Bono de Reforzamiento Estructural program, which provides non-reimbursable vouchers to poor households). While Fondo Mivivienda provides the money for the loans, commercials banks are responsible for determining an applicant's creditworthiness, administering the loans, and collecting repayments. Thus, borrowers have to agree to a traditional financial loan in order to access most of the programs underwritten by Fondo Mivivienda.

- **Programa Mejoramiento Integral de Barrios** aims to help improve the quality of life of the urban population in marginal neighbourhoods through the co-financing and co-participation of the Ministry of Housing, local government, and the beneficiary population.

- **COFOPRI brigades** investigate properties that can potentially be formalized. If there is a legal conflict, they work with related agencies and do the necessary studies to formalize the property. One of the requirements for the formalization of a property is that its inhabitants have resided there since at least December 2014.

3.5 Individual Initiatives

- **Faenas comunales (community tasks)** are initiatives developed by agrupaciones familiares to achieve specific goals. The leaders of an agrupación familiar design a project that will benefit the entire group, collect money or obtain resources from the municipality to implement the project, and assign roles and responsibilities to each of the group's members (for example, transporting materials, helping build, or just contributing money). The concept of faena comunal is related to the Incan tradition of donating days of labour for the good of the community; as such, faenas comunales usually involve the participation and effort of all members of an agrupación familiar.

- **Individual initiatives** include all efforts by the inhabitants of Barrios Altos and José Carlos Mariátegui to upgrade their neighbourhoods or their own houses. The construction process in these areas is incremental and ongoing, since residents do not have access to the financial capital necessary for building adequate housing all at once. Thus, they invest small amounts of money into housing improvements whenever they have the capacity to do so.

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4 Options to Finance Improved Housing and Neighbourhood Resilience

After assessing the current situation in José Carlos Mariátegui, CLIMA and UN-Habitat were able to develop a financial scheme to determine the investment necessary to upgrade houses into resilient and safe homes. The first step in the process was to gather data regarding past investments in housing units, household's exposure to risk, access to various public utilities, and other factors. This was undertaken by the CLIMA team, which conducted a survey of 322 households in José Carlos Mariátegui. After analysing the survey responses, a set of assumptions were made to facilitate the development of the financial scheme. Then, by considering the impact of various policies that affect the interest rate, down payments, and repayment terms of the loans used to finance the improvements, it was possible to assess the overall cost and affordability of several different policy options. Finally, policymakers are presented with several strategic considerations to take into account when deciding which policy option is the most appropriate in José Carlos Mariátegui.

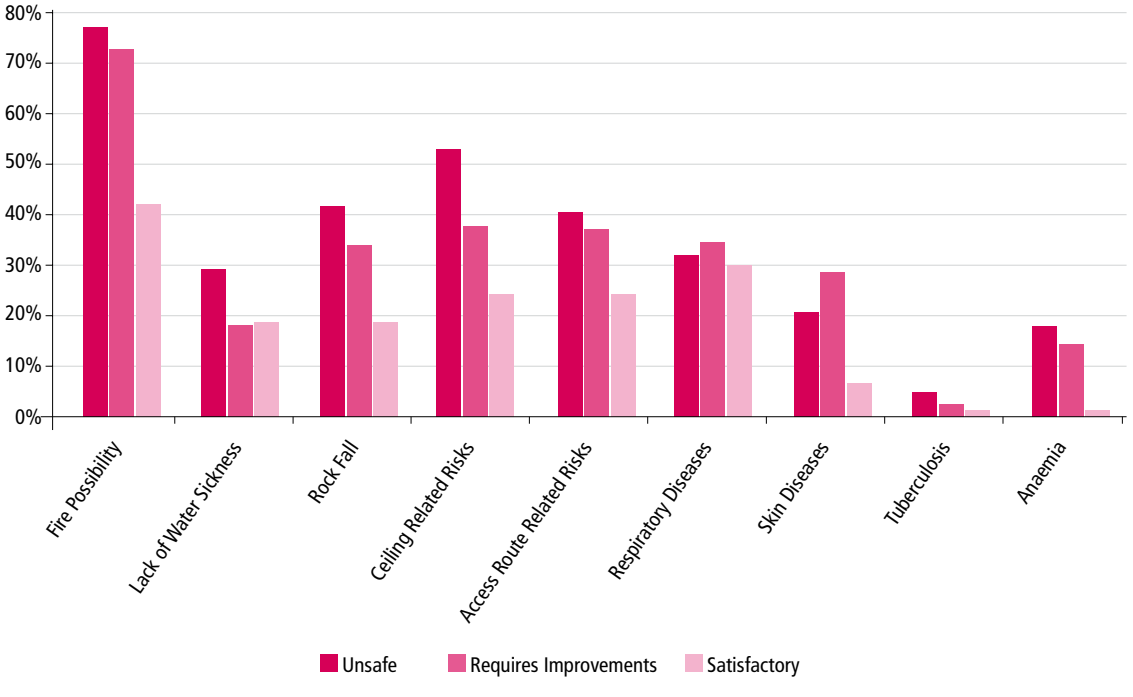
4.1 Assumptions

Three sets of assumptions were used in the development of the financial scheme. The first related to household conditions, which allowed households to be grouped according to characteristics such as the physical condition of the houses and the income level of the households. The second set of assumptions related to the level of investment necessary to make housing units safe and resilient. The third and final set of assumptions related to financial elements such as interest rates.

4.1.1 Housing Condition

Based on its assessment of 322 households in José Carlos Mariátegui, the CLIMA survey team sorted the houses into three basic categories: "unsafe", "requires improvements", and "satisfactory". Just 5.3 percent of the houses in José Carlos

Figure 11: Correlation between common risks and housing unit conditions



Mariátegui were considered to be in satisfactory condition, while 72.7 percent were considered to require improvements and the remaining 22.1 percent were considered unsafe.

Furthermore, it is possible to detail the extent to which specific health and safety hazards—such as the risk of fire or the presence of tuberculosis—affect the houses in each category. Figure 11 illustrates the positive correlation between housing unit condition and the probability of suffering one of the associated daily risks—that is, households that lack more of the essential characteristics of adequate housing are more likely to suffer housing-related mishaps. For example, the risk of fire is roughly twice as high in "unsafe" houses as in "satisfactory" houses.

In addition, factors such as security of land tenure and access to public services also correlate strongly with the three housing categories in José Carlos Mariátegui. (See Figure 12.) For example, more than 90 percent of "unsafe" houses lacked property titles, while only about 50 percent of "satisfactory" houses lacked them.

4.1.2 Household Wealth

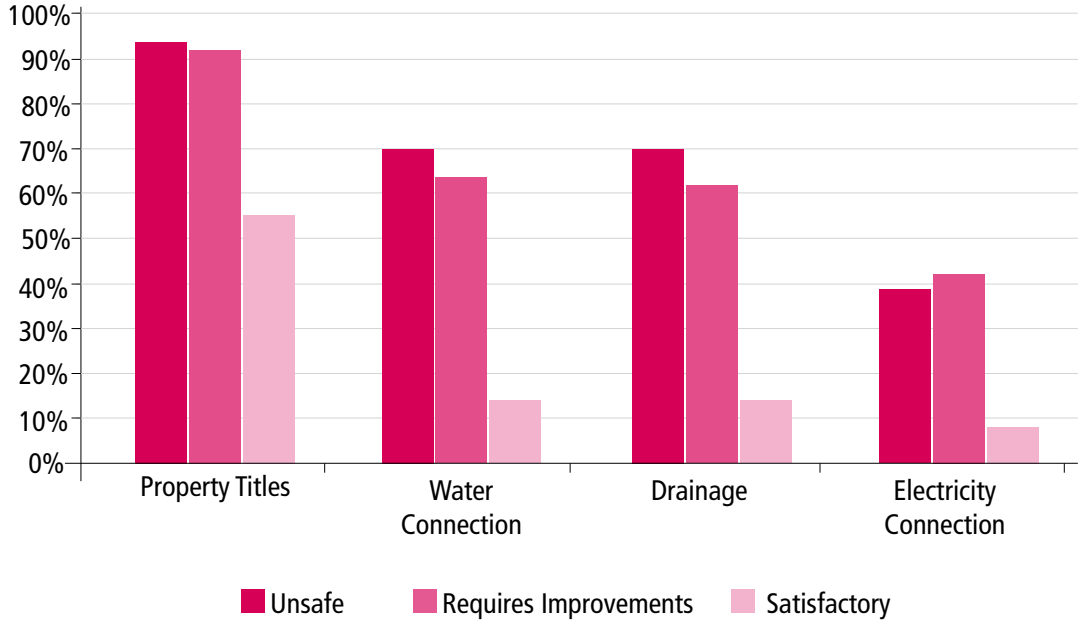
While the survey conducted by CLIMA in José Carlos Mariátegui did not directly ask households to report their incomes, the survey did yield significant information on investments and expenditures on housing in the neighbourhood. It was possible to use the information on annual investments in housing as a proxy for household income, which gave us an approximation of the overall wealth levels of the households.[13] The household income proxy was developed following these steps:

i. Summing up all the investments in the house to date, including for plot acquisition, land levelling, structural improvements for minimizing ceiling-related and access-related risks; property titling; permits for using water, sewage, and electricity services; payments for paperwork; and investments in health and safety improvements to minimize fire risks, gastrointestinal illnesses, rock falls, respiratory illnesses, skin diseases, and other risks.

ii. The sum of these investments was divided by the number of years that had passed since the plot was acquired and 2015, when the CLIMA survey was conducted. This yielded an estimate of the average annual investment made in the house.

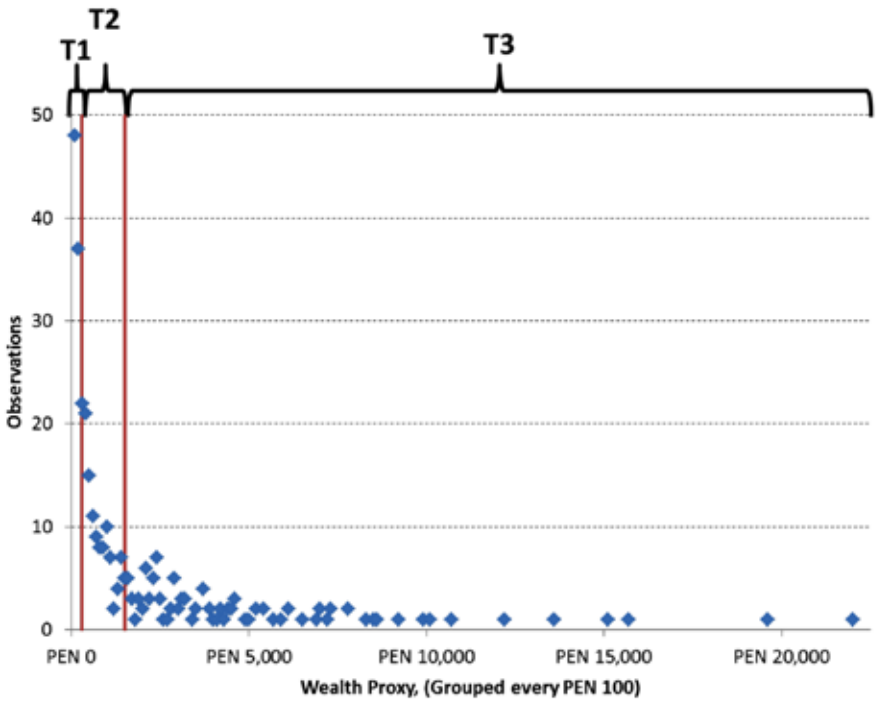
iii. Annual investment estimates for the 322 housing units were then grouped into terciles of 107, 107, and 108, with the first tercile (T1) representing the lowest values, the second tercile (T2) representing the intermediate values, and the third tercile (T3) representing the highest values.

Figure 12: Correlation between land tenure security, access to public services, and housing unit conditions



[13] As a lesson learned, we would include a direct question on household income in future surveys.

Figure 13: Household wealth proxy (grouped by 100 PEN)



Source: Authors

The wealth proxy (in Peruvian nuevos soles) had a minimum value of PEN 0 and a maximum value of PEN 21,923 ($6,577).[14] The average annual investment was PEN 1,812 ($544), while the median value was PEN 661 ($198).

Each point in Figure 13 represents the number of households that made the corresponding amount of annual investment in the housing unit. The distribution is heavily skewed to lower levels of investment, indicating that the majority of households in José Carlos Mariátegui have very little accumulated wealth. The data points in the first tercile (T1) fall between PEN 0 and PEN 294 ($88). The second tercile (T2) falls between PEN 295 ($89) and PEN 1,498 ($449). Finally, the third tercile (T3) ranges from PEN 1,499 ($450) up to PEN 21,923 ($6,577).

4.1.3 Agrupación Familiar

The financial scheme we developed is based around the concept of the agrupación familiar, which was defined in Section 3. One of the main reasons for focusing on the agrupación familiar, an institution already familiar to the inhabitants of José Carlos Mariátegui, is that it provides a ready-made institution capable of serving as the intermediary between the lenders, inhabitants, and other relevant institutions such as the municipal government. In this sense, the agrupación familiar will perform a role similar to that of the community associations in the Philippines' Community Mortgage Programme. (The Community Mortgage Programme will be discussed in detail later in this report.) Under the assumption that the agrupación familiar can be formalized as an institution with the legal capacity to receive loans, distribute the money among the inhabitants, and collect the money from the inhabitants when they repay the loan, the group would be involved in the following steps:

i. Assist a technical team to determine what improvements are needed by each of the houses in the agrupación familiar.

ii. Receive the loan and the subsidies that will cover the investments made in each of the houses in the agrupación familiar.

[14] Throughout this report, values in Peruvian nuevos soles are converted to U.S. dollars at an exchange rate of PEN 1 to $0.30.

iii. Distribute sufficient funds to the households to undertake the improvements identified in step 2.

iv. Assess the improvements made to each of the houses and ensure that they are using the money according to the needs and agreements.

v. Collect monthly payments from each of the houses.

vi. Pay back the loan according to the agreements between the agrupación familiar and the financing institution.

CLIMA surveyed nine agrupaciones familiares in José Carlos Mariátegui: Portada de Belén, Biohuerto Paraíso, Santa Rosita, U6A, 12 de Octubre Nueva Generación, Corazón de Jesús, 12 de Octubre, Quebradas Verdes, and 26 de Enero las Lomas. Based on this information, along with information gathered from the housing conditions survey and the estimate of household wealth, the average agrupación familiar is assumed to have the following characteristics for the purposes of developing our financial scheme:

- It consists of 92 houses.
- Twenty of the houses are assumed to be in "unsafe" condition, 67 houses "require improvements", and five houses are in "satisfactory" condition.
- The condition of the houses are roughly equally distributed among the three terciles of household wealth, as shown in Table 2.

Table 2: Assumed distribution of housing conditions and household wealth in the average agrupación familiar

	T1	T2	T3
Unsafe	7	7	6
Require Improvements	22	22	23
Satisfactory	1	2	2

4.1.4 Housing Unit Investments

According to UN-Habitat (2009), adequate housing is defined by seven criteria: security of tenure; availability of services, materials, facilities, and infrastructure; affordability; habitability; accessibility; location; and cultural adequacy. (These requirements are summarized in Figure 15.[15]) Based on these criteria and the information gathered in CLIMA's surveys, it was possible to estimate the total investment required for a target house—that is, a house that is improved and upgraded into a safe and resilient housing unit—in each of the three housing categories.

Figure 14: Requirements for a house to be safe and resilient

Lot Area: At least 90 square meters

Property Titles: Have a Property Title

Land Levelling: Levelling the hole lot, leaving it on safe and resilient conditions

Housing Unit Structure: Have a house structure made of bricks and cement

Public Services: Have water, electricity and drainage directly connected to the public service provider and inside the house

[15] It is important to note that all the requirements for adequate housing discussed here comply with Peru's legal framework for housing *(Reglamento de habilitación y construcción urbana especial).*

The requirements listed in Figure 15**Error! Reference source not found.** establish a standard and a baseline for achieving an adequate housing unit. After setting this baseline, the next step was to identify the amount of investment necessary for a typical house in each of the three categories—one for an average house in unsafe condition, one for a house that can be made adequate through improvements, and one for a house in satisfactory condition. This means that for each of the three housing conditions, an investment gap for each one of the five requirements—lot area, property titles, land levelling, housing unit structure, and public services—was identified.

The total amount of the gap is expressed in Peruvian nuevos soles and has two main components: quantity and price per unit. The price per unit is standard for each of the five requirements, and it was estimated based on the average prices paid by households in the area that have met the established requirements for housing adequacy. (A summary of the criteria and investments required for improving housing in each of the categories into safe and resilient homes can be found below in Table 6.)

An explanation of the quantities and prices per unit for each of the requirements can be seen below:

- **Plot acquisition:** The plot area required for adequate housing was estimated by identifying households that have failed to meet the minimum requirement area of 90 square meters. In each category, the gap was summed up and divided by the total number of houses. The price per square meter was estimated by averaging the price per square meter of houses that have property rights. For example, the average unsafe house falls short of the 90 square meter standard established by the Reglamento de habilitación y construcción urbana especial by 2.79 square meters. Each square meter of land costs PEN 54.07 ($16.22), so the average house in unsafe condition lacks PEN 150.79 ($45.24) of investment to meet the minimum requirement.

- **Property titling:** The necessary investment for property titles was estimated by assessing the percentage of houses in each one of the housing categories that do not currently have property titles. This was then multiplied by the average price of acquiring a formal property title, which was estimated by averaging the costs incurred by other households in the area to acquire property titles—information that was available from CLIMA's survey of housing units.

- **Land levelling:** The amount of plot to be levelled is expressed in square meters and was estimated by summing the area of all the lots that lack proper levelling and dividing by the total number of houses per category. The average cost for proper levelling—defined as the price per square meter that houses in satisfactory condition paid for levelling their plots—was PEN 38.82 ($11.65) per square meter. This suggests that households that paid less than PEN 38.82 per square meter are improperly or unsatisfactorily levelled. To arrive at the investment necessary for proper levelling, the price of proper levelling per square meter, PEN 38.32, was multiplied by the total size of the plot. That is, it does not matter if households had made prior investments of less than PEN 38.32 per square meter, because the entire levelling process would have to be done again.

- **Housing unit structure:** Houses in all three categories have some sort of structure. However, in most cases, the structures are not adequate. An adequate housing unit structure is defined as that one made of brick and cement, which costs an average of PEN 231.81 ($69.54) per square meter, according to the data gathered. The average structure area is expressed in square meters and was estimated by the following formula.

  *House Structure Area = 25 m2 + (5 * (Number of Household Inhabitants – 1))*

  In accordance with Peru's legal framework for housing, Reglamento de habilitación y construcción urbana especial, the minimum housing unit area is 25 square meters, with an additional five square meters for each additional person who regularly resides in the house. It is important to note that this assumption was made for sustainability reasons; as mentioned above, the minimum housing area according to the legal framework established by Peru's Housing Ministry is 25 square meters, with no additional space requirement for additional inhabitants. Beyond this concession, the housing structure requirement has been kept to the minimum size possible, because it is the single biggest expense per square meter.

  The quantity of housing unit structure was estimated by subtracting from the overall housing unit area any parts already built of brick and cement (if any) and summing those values for each of the categories, and then dividing them by the total number of houses per category.

- **Public services:** Public services are divided into three categories: water connection, sewage connection, and electricity connection. The ideal public service in all three categories is one that is provided directly by the public service company and connected directly to the house. The price per unit for public services was calculated by estimating the prices paid by those houses that already have the services. The quantity of services required was obtained by estimating the proportion of housing units that did not have the services as ideally described in each housing condition category.

4.1.5 Financial Scheme

In addition to the primary assumption of sustainability, the financial scheme developed for safe and resilient housing in José Carlos Mariátegui is also based on a set of assumptions regarding interest rates, discounts, type of subsidies, etc. These assumptions are based primarily on factors and conditions specific to housing and financial markets in Peru, although similar projects around the world are also taken into account.

The assumptions made for each component of the financial scheme are explained below:

- **Interest rates**: It is clear that the people living in José Carlos Mariátegui have restricted access to the traditional financial sector. Because of this, there is not enough information to formulate a benchmark interest rate applicable to the neighbourhood's demographic profile. Two sources of information where used to determine the range in which the interest rate might vary for the inhabitants of José Carlos Mariátegui and which will keep the private sector interested on investing.

  The first source of information is the interest rates for mortgages used by the traditional banking sector in Peru. (See Table 3.) The mortgages offered by the traditional banking sector are usually given to borrowers with a safe credit history. Determining the risk premium to be added to the loans that can be offered to the inhabitants of José Carlos Mariátegui will require significant effort, but according to Nohn (2016) the risk premium will vary between 12 percent and 15 percent, which means that a five-year loan will carry an average annual interest rate between 25 percent and 28 percent.

  The second source of information is the Cooperativa San Hilarión (CSH), one of the few financial institutions operating in José Carlos Mariátegui. As it name implies, CSH is a financial cooperative. It provides several different loan options, including loans with daily payments, and it targets its lending at informal workers with any source of regular income, such as those operating small shops or other kinds of business. According to the information available, CSH's monthly interest rates vary between 1.3 percent and 3.4 percent, implying an annual average interest rate ranging from 17 percent to 49 percent, which is a very large spread.

  Sometimes it is possible for the government to subsidize the interest rate. This means that the government will assume some of the interest that the household has to pay, thereby diminishing the instalments that the household has to pay.

- **Community mortgage:** As noted before, agrupaciones familiares are important institutions for residents of José Carlos Mariátegui. Although the agrupaciones familiares in the neighbourhood do not currently possess the legal tools to function as intermediaries between residents and financial institutions, giving them these tools could potentially result in significant benefits for the inhabitants of José Carlos Mariátegui.

  If an agrupación familiar serves as an intermediary, it can help mitigate risk by participating in the lending decision and serving as a joint liability group. Because the services that it provides—including managing cash flows with households and carrying the money to the lender—are possibly done for free, the agrupación familiar can also bring down the operational spread of the interest rate. However, these services are never completely without cost: agrupaciones familiares need to develop the capacity to manage funds properly, and there regular audits will have to occur in order to minimize the risk of misappropriation or other misuses of funds.

  Figure explains the potential benefits that a community finance programme can bring in terms of savings or interest rate reductions for loans. The assumption made in the financial scheme for José Carlos Mariátegui is that, if a community finance loan programme is implemented, the interest rate reduction will be between 0 and 8 percent (with Nohn suggesting that a 5 percent reduction is most likely).

Table 3: Mortgage interest rates in Peru (July 2016)

	Loan Terms				
	5 Years	10 Years	15 Years	20 Years	30 Years
ScotiaBank	12.50%	12.50%	12.50%	14%	14%
Interbank	13.52%	13.52%	14.42%	14.62%	16.11%
BCP	12.40%	12.40%	12.40%	13.40%	13.90%
Average Year Interest on the Market	12.81%	12.81%	13.11%	14.01%	14.67%
Average Month Interest on the Market	1.01%	1.01%	1.03%	1.10%	1.15%

Figure 15: Potential benefits of community finance

The positive impact of collective delivery and social collateral: a potential interest rate reduvtion of 8%! (Stylized example)

Interest Rate Formula	Individual Bank Loan	Community Finance
= Administrative Cost	= 6%	= 2% (Collective delivery ***)
+ Net Cost of Funds	+ 8%	+ 8%
+ Capitalization	+ 2%	+ 2%
+ Loan Losses	+ 5%	+ 2% (Social collateral)
+ Foregone Interest	+ 1.1% (21% - (1 - 95%)	+ 0.3% (14% - (1 - 98%)
	= 22.1%	**= 14.3%**

$$R = \frac{AE + LL + CF + K - 11}{1 - LL}$$

****Individual versus collective delivery: eg $30 of $ 1000,000.*
Adapted from CGAP's formula for setting sustainable interest rates published in CGAP Ocaasional Paper 1

Source: Nohn (2016).

- **Loan term:** Just as the lack of formal financial histories is likely to cause residents of José Carlos Mariátegui to pay an interest rate premium for credit, loan terms offered to residents are likely to be very short due to the instability of their economic conditions. In this context, "short" is considered to be not longer than five years to repay the entire loan. These loan terms are similar to the ones offered by Cooperativa San Hilarión, which, as mentioned before, is probably the financial institution that is most familiar to the people living in José Carlos Mariátegui.

- **Down payment:** A down payment is an initial payment made in cash when purchasing an expensive good such as a house. While the financial scheme developed in this report is intended to finance upgrades or improvements to a property rather than the purchase of a property itself, the scheme assumes that down payments will be required because of the risk profile of the potential borrowers. Down payments on a mortgage range from 15 percent to 30 percent, which is the range that will be used in the financial scheme.

  The down payment has to be paid by the borrower before the loan is disbursed. The primary objective of the down payment requirement is to assess the financial responsibility and creditworthiness of potential borrowers. Institutions such as Colombia's Contractual Voluntary Savings Programme impose similar requirements in order to gauge creditworthiness. (See Box 1.) The second objective of the down payment requirement is to lower the monthly instalments of the loan's repayment.

Box 1: Contractual Voluntary Savings Programme (Colombia)

The Contractual Voluntary Savings Programme (Programa de Ahorro Voluntario Contractual, or AVC) was launched in 2007 by the Fondo Nacional del Ahorro, a public institution whose mandate is to increase the access of all Colombians to dignified and affordable housing.

To sign up for the program, participants must pledge to deposit each year an amount equal to their monthly salary. Participants are required to pledge their monthly salary upon enrolment, then make monthly instalments towards that amount each month. When participants' voluntary savings during a 12-month period add up to their monthly salary, they become eligible for a credit evaluation. Participants must deposit the required monthly instalment on time, as agreed to when entering the program. If participants fail to make deposits on time or save less than the pledged amount, they can make up payments before the expiration of the 12-month period.

Participants who have successfully completed their savings plan are not guaranteed credit for housing. However, if they meet the minimum requirements by fulfilling their savings schedule, they are more likely to be deemed financially responsible and eligible for credit. The resources used to leverage these loans come from workers' unemployment savings resources and funds saved by the users of the AVC program.

The financial scheme recognizes that some nontrivial amount of time will pass before households can save the money needed to make a down payment, and that the construction costs will increase during this period of time. However, this effect can be offset by potential increases in wage and income growth, which are typically higher than the rate of inflation of construction costs. For simplicity, the financial scheme will assume that any future increases in the cost of construction or acquiring services will be completely and exactly offset by increases in the wealth proxy.

A down payment subsidy can be given by an institution for a loan. This means that before the loan is given, an institution disburses an amount of money in advance, which will reduce the total amount of the loan and, as a consequence, ceteris paribus, the household instalments will be lower.

- **Buy-down:** A buy-down loan is a loan that speculates on the nominal income growth of the borrowers and gradually phases out subsidies. As mentioned above, some amount of time can pass before households can accumulate the money necessary to pay a down payment. Although during this time the cost of building might increase, this adverse effect is typically minimized or even completely offset by the borrower's income growth over the same period. Under this assumption, the rate at which monthly instalments can be increased each year was estimated by subtracting the inflation rate (2.59 percent) from the rate of income growth (4.66 percent), resulting in an annual increase in the monthly instalments of 2.07 percent.[16]

- **Desired initial instalment:** The objective of the buy-down loan is to start the borrower's repayments of the loan at a low, affordable amount—the desired initial instalment. Because information on income and creditworthiness may be lacking or difficult to verify, it can be difficult to determine beforehand what constitutes an affordable monthly instalment. Instead, the financial scheme will use the monthly wealth levels shown in Table 4 as a proxy for the desired initial instalment. Because of the lack of information about the potential borrowers, the proxy is the better indicator of what each household has been investing in its house each month, which in turn indicates what it is willing to spend on housing-related issues.

- **Net present value:** Net present value is used in the financial scheme to estimate the cost to the government of providing a subsidy over the course of a loan. Net present value is estimated with a discount rate of 5.755 percent per year (0.47 percent per month), which is the nominal yield on Peruvian T-bills (Peru Government Bond 9Y).

Table 4: Monthly wealth levels[17]

	T1	T2	T3
Minimum Value	PEN -	PEN 25.00	PEN 125.81
Maximum Value	PEN 24.47	PEN 124.82	PEN 1,826.88
Average Value	PEN 9.91	PEN 61.76	PEN 379.17
Median Value	PEN 9.03	PEN 55.00	PEN 263.79

4.2 Financial Scheme Results

After setting up the assumptions to be used in the construction of the financial model in this report, it was possible to formulate results for several sustainable options for improving the houses in José Carlos Mariátegui. The results consist of an analysis of the level of investment required to transform José Carlos Mariátegui's housing into adequate housing as well as an analysis of which funding scenarios will make those investments affordable to the greatest number of households.

4.2.1 Investments

The investments necessary for each of the three housing categories in an average agrupación familiar is shown in Table 6. The investment required for the houses in an unsafe condition is the largest of the three, needing an investment of PEN 12,351 ($3,705)). The second largest investment required is for the houses that require improvements, needing PEN 11,355 ($3,407). The smallest investment necessary for turning a house into a safe and resilient house is for housing considered to be in satisfactory condition, with a required investment of PEN 5,539 ($1,662). As mentioned above, these amounts are estimates for an average housing unit in each category of condition.

Our analysis indicates that land levelling and structural aspects of the housing unit are by far the costliest components of the overall investment required to create safe and resilient housing. As shown in Figure 16, these two components account for more than 90 percent of the total investment in each of the three categories. By contrast, the provision of public services accounts for no more than 3 percent of the total investment (or PEN 286, or $86, in nominal terms). The relative affordability of providing public services, which are likely to be perceived as an immediate upgrade with direct effects on the well-being of the population served, might encourage policymakers make this a short-term funding priority.

[16] The inflation rate was estimated by averaging the International Monetary Fund's projected inflation rate for the six year period 2016–21. The income growth rate is defined as the compound annual growth rate from the last 16 years (2000–16) of the minimum wage (remuneración minima vital) established by Peru's Ministry of Labour.

[17] The monthly wealth levels were estimated dividing the yearly wealth levels into the 12 months of the year.

The total investment required for an average agrupación familiar with 92 housing units is PEN 1,033,817 ($310,145). Twenty-four percent of this total would be for upgrading existing houses in unsafe condition, 73 percent for houses that require some improvements, and the remaining 3 percent for houses in satisfactory condition. On average, 3.8 people live in each house, meaning that the total investment can improve the lives of approximately 350 people can be improved, at a per person cost of just PEN 2,957 ($887).

Table 5: Total investment for an average agrupación familiar

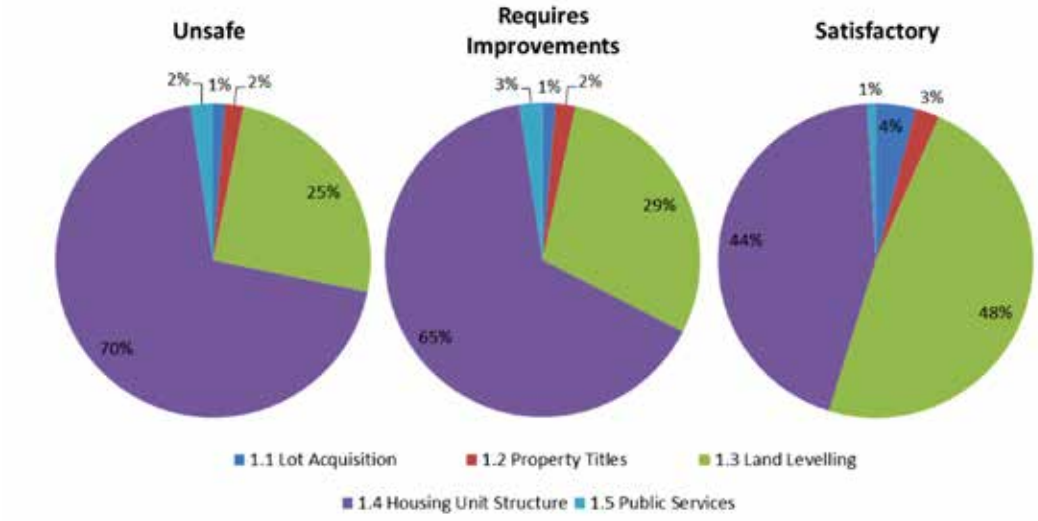
	Unsafe	Requires Improvements	Satisfactory	TOTAL
Housing per Housing Category	20	67	5	
Required Investment	PEN 12,350.91	PEN 11,355.26	PEN 5,539.48	
Total Investment per Housing Category	PEN 249,866.22	PEN 757,117.42	PEN 26,832.92	PEN 1,033,817

Table 6: Necessary Investments to upgrade a housing unit into a safe and resilient housing unit

Loan Summary									
Average Houses for each Agrupacion Familiar	Unsafe			Requires Improvements			Satisfactory		
	20			67			5		
	Quantity	Price per Unit	Total	Quantity	Price per Unit	Total	Quantity	Price per Unit	Total
1. Required Investmet		**PEN 12,350.91**			**PEN 11,355.26**			**PEN 5,539.48**	
1.1 Lot Acquisition	2.79m2	PEN 54.07	PEN 150.79	2.81 m2	PEN 54.07	PEN 152.19	4.24 m2	PEN 54.07	PEN 229.00
1.2 Property Titles	91.55%	PEN 255.77	PEN 234.15	89.66%	PEN 255.77	PEN 229.31	52.94%	PEN 255.77	PEN 135.41
1.3 Land Levelling	79.86m2	PEN 38.82	PEN 3,100.22	85.34 m2	PEN 38.82	PEN 3,318.18	68.82 m2	PEN 38.82	PEN 2,671.80
1.4 Housing Unit Structure	37.01m2	PEN 231.81	PEN 8,579.37	31.88 m2	PEN 231.81	PEN 7,389.04	10.59m2	PEN 231.81	PEN 2,454.49
1.5 Public Services			PEN 286.39			PEN 271.55			PEN 48.78
1.5.1 Water Connection	67.61%	PEN 147.50	PEN 99.72	61.21%	PEN 147.50	PEN 90.28	11.76%	PEN 147.50	PEN 17.35
1.5.2 Water Connection	67.61%	PEN 158.86	PEN 107.40	59.48%	PEN 158.86	PEN 94.49	11.76%	PEN 158.86	PEN 18.69
1.5.3 Water Connection	36.62%	PEN 216.47	PEN 79.27	40.09%	PEN 216.47	PEN 86.77	5.88%	PEN 216.47	PEN 12.73

Source: Data taken from "Encuesta de Hogar – José Carlos Mariátegui" and "Encuesta por Asentamiento José Carlos Mariátegui – Para la Junta Directiva". Financial model constructed by the authors.

Figure 16: Investments by housing category (percentage of total required investment)



Source: Prepared by the authors.

4.2.2 Funding Scenarios

As mentioned elsewhere, the financial scheme developed in this report has the intention of being attractive for both private and public sector investors. In line with this premise, different scenarios were developed to facilitate a comparison of the possible alternatives for producing desirable and sustainable housing outcomes that meet the needs of the inhabitants of José Carlos Mariátegui, the various government entities involved, and private investors. The first scenario presented will be one in which no cost-reducing subsidies are provided, which will form a baseline scenario that we will subsequently compare with each of the scenarios involving subsides. This comparison will illustrate the potential cost to the institution of providing the subsidy as well the potential benefits to the inhabitants of José Carlos Mariátegui.

The assumptions underlying the baseline scenario are as follows:

- **Investment amount:** While the estimated amount of investment required varies for each of the three housing categories, the model will assume that the required investment is the same for all categories, at PEN 5,339 ($1,602). This is the investment required to make an average house in satisfactory condition completely safe and resilient. This assumption is made to simplify the comparison of the various subsidy scenarios.

- **Interest rate:** The model assumes an interest rate of 30 percent per year (2.21 percent per month).

- **Loan term:** The term of the loan is assumed to be 5 years (60 months).

- **Down payment:** The model assumes that 20 percent of the total investment will be paid as a down payment, meaning that borrowers have to pay PEN 1,107.90 ($332.37) before the loan is disbursed.

- **Desired initial instalment:** No desired initial instalment.

The scenarios developed will show results for an average household in each of three wealth terciles and for each of three housing condition categories. The model's results consist of the amount of the monthly repayment instalment for each of the average households and the total subsidy to be given by the funding institution.

4.2.2.1 Baseline Scenario

The results of the baseline scenario are shown in Table 7. Under this scenario, the monthly loan repayment instalment is PEN 134.07 ($40.22) for each of the three housing categories and for each of the three wealth levels. Based on the estimates of monthly household wealth in José Carlos Mariátegui (as shown in Table 4), only households in the wealthiest tercile would be able to meet the loan repayment obligations. Thus, only the 102 households in the wealthiest tercile (or 32 percent of all households) would be able to afford an unsubsized loan. Counting the 20-percent down payment and the 60 monthly instalments, the total amount paid by the households over the course of the loan is PEN 9,151.82 ($2,745.55).

4.2.2.2 Community Mortgage

As explained above, a community mortgage programme can significantly improve the affordability of a loan. The mechanism through which this affordability is achieved is a reduction in the interest rate ranging between 0 and 8 percentage points. This does not, however, include the cost of building capacity in the institution that will be responsible for collecting and distributing the money (which, in the case of José Carlos Mariátegui, is ideally the agrupación familiar). For simplicity, we estimate that the cost of institution building will be 1 percent, meaning that the range of the interest rate reduction will be from 0 to 7 percentage points. A 7 percentage point decrease in the interest rate means that the interest rate used in this scenario will be 23 percent; all other conditions will remain ceteris paribus. This scenario was based on the Community Mortgage Programme (CMP) in the Philippines (see Box 2).

Box 2: Community Mortgage Programme (Philippines)

According to the World Bank, the poverty rate of the Philippines was 25.2 percent in 2012. This, coupled with a lack of affordable housing, has resulted in the proliferation of informal settlements. Informal settlements in the Philippines grew at an annual rate of 7.2 percent between 1991 and 2012. For 2011, there were approximately 1.5 million informal settlements in the country—40 percent of which were located in Manila, the capital. Using Manila as a proxy for the rest of the country, it is estimated that 48 percent of informal settlers live on privately owned land and 27 percent on government-owned land, while the remaining 25 percent live in dangerous areas where infrastructure reforms are desperately needed.

Indeed, the current situation in the Philippines is not much better than it was nearly 30 years ago, when the National Home Mortgage Finance Corporation (NHMFCF) launched the Community Mortgage Programme (CMP) in 1988. In 1992, CMP was folded into the National Shelter Programme, converting its status from a corporate programme of the NHMFC to a socialized housing programme of the national government. In January 2004, the CMP folded into the newly created Social Housing Finance Corporation (SHFC), which administers and finances all the NHMFC social housing programs.

The CMP is a financing scheme that brings community members together and leverages that unity as an instrument to formalize land tenure. The programme principally targets households in the lowest income groups—mostly informal settlers, slum dwellers, or tenants of areas with priority for development. What all members of the CMP have in common is that they occupy land through informal means. To participate in the CMP, members create a community association that serves as the legal representative of their community and which works to acquire loans and manage repayments.

The government provides the loans to the community associations at a competitive rate of 6 percent per annum and a generous repayment term of 25 years. The community association can apply for a loan when its members have successfully participated in a savings program for at least one year, which allows them to cover the application fees. Once the loan is approved, the community association is also responsible for collecting individual contributions for the loan payment. After a year of successful repayment from the community association's members, it they are permitted to individualize the land.

The results of a community mortgage can be seen in Table 8. Applying an interest rate of 23 percent per year, the amount of the monthly repayment instalments falls from PEN 134.07 ($40.22) in the baseline scenario to PEN 119.59 ($35.88)—a drop of 10.8 percent, which is a significant reduction for low-income households. The total amount paid by a household under a community mortgage programme for a loan of PEN 5,539.48 ($1,661.84) supported by the agrupación familiar will be PEN 8,283.46 ($2,485.04). Compared to the baseline scenario, households will realize a 9.49 percent (PEN 868, or $260) reduction in the total cost of the loan. Even with this reduction, however, only households in the wealthiest tercile will be able to afford this type of loan. But in this scenario the proportion of households able to pay increases slightly, from 32 percent to 34 percent.

4.2.2.3 Interest Rate Subsidy

An interest rate subsidy can be provided in two ways—by concessional liquidity or by payment match. Concessional liquidity is when the government provides a share of the liquidity for the loan at a concessional interest rate; in exchange for the liquidity, banks reduce their lending rates. The concessional liquidity option can be very expensive for governments. Because the nominal amount returned to the government is the same as the concessional liquidity it provides, governments that face higher financing costs will receive a negative return on their outlay. Because of this reason, we will not consider concessional liquidity in this option.

The interest rate subsidy used in this scenario is the payment match. This is when the government matches the affordability gap between a loan at a market rate and a subsidized one. The net present value of the subsidy is placed into an escrow account with the loan originator to avoid policy risk (for example, if the programme ends before the loan is completely amortized). Each month, the payment match is withdrawn from the escrow account when the household pays its loan instalment.

The baseline scenario has an interest rate of 30 percent, which is completely paid by the households. In this scenario, if the interest rate subsidy is 15 percent, it means that the government will pay half of the annual interest rate and the households the other half. The results of the interest rate subsidy can be seen in

The monthly instalment for the households in this scenario is PEN 103.25 ($30.98), a decrease of 23 percent compared with the baseline scenario. The total amount paid by the household for the loan is PEN 7,303 ($2,191), which is a decrease of 20 percent, ceteris paribus, in comparison with the baseline scenario. However, this is the first scenario in which a subsidy has been given (an estimate of the subsidy to be given to an average household in each of the three condition categories is also shown in Table 9).

The total amount of subsidy in net present value at a discount rate as described above is PEN 147,638 ($44,291). This means that at the beginning of the programme, the institution providing the subsidy will have to deposit PEN 147,638, and the financing institution will still receive an interest rate of 30 percent per year. Under these circumstances, only 122 of the 322 households surveyed would be able to afford the monthly payments (including all 108 of the households in the wealthiest tercile and 14 from the second tercile). This represents an increase of 6 percent of households compared with the baseline scenario (or 38 percent of the 322 houses surveyed).

4.2.2.4 Down Payment Subsidy

A down payment subsidy is intended to be provided to the borrower at the time of the loan's origination, thus reducing the loan amount and avoiding cumulative interest. In this model, the total subsidy given in this scenario will be the net present value of the subsidy given in the interest rate subsidy scenario. This will facilitate the comparison between scenarios. The results can be seen in Table 10.

The down payment subsidy given to each household in this scenario is PEN 1,609 ($483). This means that for a total investment of PEN 5,539 ($1,662), each household will have to pay PEN 3,930 ($1,179) of the total investment, distributed as follows: PEN 786 ($236) in the initial down payment of 20 percent and and PEN 3,144 ($943) on monthly instalments of principle and interest. All other conditions remain as in the baseline scenario. Thus, the monthly instalment payments will be PEN 95.12 ($28.54). The total amount that will be paid by the household over the term of the loan is PEN 6,494 ($1,948), including the down payment and the monthly instalments, which is a PEN 2,658 ($797), or 29 percent, reduction compared with the baseline scenario. In nominal terms, all households located in the third (wealthiest) tercile of the wealth proxy are able to afford the down-payment subsidized loan, along with 17 households in the second (middle) tercile (or three more than the interest-rate subsidy scenario). In all, 39 percent of households in José Carlos Mariátegui would be able to repay the loan under these conditions.

As mentioned above, the total amount of subsidy per agrupación familiar will be PEN 147,638 ($44,291). The financing institution will still receive an interest rate of 30 percent for loans provided for 5-year terms. The difference is that the down payment subsidy will reduce the loan received by households by PEN 1,286 ($386), lowering the loan total from PEN 4,431 ($1,329), as in the previous scenarios, to PEN 3,144 ($943). For the financing institution, this is both a pro and a con: a pro because the loan is smaller, which translates into a reduction in risk for the lender; a con because it means a smaller portion of income in nominal terms.

4.2.2.5 Buy-Down Subsidy

A buy-down subsidy is one that speculates on nominal income growth and gradually phases out subsidies, as explained above. Typically, the net present value of the total subsidy is provided at the time of the loan's origination (similar to a down payment) to mitigate policy risk. However, a buy-down subsidy is not placed into the borrower's account, and thus does not reduce the loan balance. The net present value can be reduced by factoring in the potential interest rate that the money can earn for the institution that receives the subsidy. This potential benefit, however, is not considered in this scenario.

In line with the previous scenarios, the buy-down subsidy scenario was developing for a total subsidy with a net present value of PEN 147,638 ($44,291) with the help of the Excel function "goal seek". The remaining loan terms were left as specified in the baseline scenario. Assuming an income growth rate of 2.07 percent per year, it was possible to determine that the first-year instalment would amount to PEN 99.29 ($29.79) for all the households. Based on this calculation, the results of the buy-down subsidy can be seen in

In this scenario, a subsidy of PEN 1,609 ($483) is given to each household. For a total investment of PEN 5,539 ($1,662), a loan of PEN 4,432 ($1,330) is provided to every household with a down payment of PEN 1,108 ($332). Even though the loan is PEN 4,432, not everything is going to be paid by the households; a portion of it will be paid by the institution providing the loan. At the end of the loan, the households will have disbursed a total of PEN 7,317 ($2,195), which is 20 percent less than the baseline scenario. The monthly instalments on the first year are reduced by 26 percent (PEN 99.29, compared to PEN 134.07 in the baseline scenario). However, it is important to remember that the monthly instalment will increase each year at a rate of 2.07 percent, so that by the fifth year the monthly instalments will be PEN 107.77 ($32.33), which will represent a 19.6 percent decrease compared with the baseline scenario.

With regard to the financial institution, the loan provided will be of PEN 4,431 at an interest rate of 30 percent repaid in monthly instalments over 5 years, similar to the other subsidy scenarios. The financing institution will provide a subsidy of PEN 147,638 ($44,291). Under these assumptions, a total of 124 of the 322 households (or 39 percent) would be able to access the loan.

Table 7: Loan summary: baseline scenario

Loan Summary									
Actual Housing Conditions	Unsafe			Requires Improvements			Satisfactory		
Tercile	T1	T2	T3	T1	T2	T3	T1	T2	T3
Investment	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48
Loan Amount without Subsidy	PEN 4,431.58	PEN 4,431.58	PEN 4,431.58	PEN 4,431.58	PEN 4,431.58	PEN 4,431.58	PEN 4,431.58	PEN 4,431.58	PEN 4,431.58
Down Payment form Households	PEN 1,107.90	PEN 1,107.90	PEN 1,107.90	PEN 1,107.90	PEN 1,107.90	PEN 1,107.90	PEN 1,107.90	PEN 1,107.90	PEN 1,107.90
Total Subsidy per House	PEN 0.00	PEN 0.00	PEN 0.00	PEN 0.00	PEN 0.00	PEN 0.00	PEN 0.00	PEN 0.00	PEN 0.00
Total Subsidy per AF	PEN 0.00	PEN 0.00	PEN 0.00	PEN 0.00	PEN 0.00	PEN 0.00	PEN 0.00	PEN 0.00	PEN 0.00
Monthly Household Installment (60 Months)	PEN 134.07	PEN 134.07	PEN 134.07	PEN 134.07	PEN 134.07	PEN 134.07	PEN 134.07	PEN 134.07	PEN 134.07

Table 8: Loan summary: community mortgage scenario

Loan Summary									
Actual Housing Conditions	Unsafe			Requires Improvements			Satisfactory		
Tercile	T1	T2	T3	T1	T2	T3	T1	T2	T3
Investment	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48
Loan Amount without Subsidy	PEN 4,431.58	PEN 4,431.58	PEN 4,431.58	PEN 4,431.58	PEN 4,431.58	PEN 4,431.58	PEN 4,431.58	PEN 4,431.58	PEN 4,431.58
Down Payment form Households	PEN 1,107.90	PEN 1,107.90	PEN 1,107.90	PEN 1,107.90	PEN 1,107.90	PEN 1,107.90	PEN 1,107.90	PEN 1,107.90	PEN 1,107.90
Total Subsidy per House	PEN 0.00	PEN 0.00	PEN 0.00	PEN 0.00	PEN 0.00	PEN 0.00	PEN 0.00	PEN 0.00	PEN 0.00
Total Subsidy per AF	PEN 0.00	PEN 0.00	PEN 0.00	PEN 0.00	PEN 0.00	PEN 0.00	PEN 0.00	PEN 0.00	PEN 0.00
Monthly Household Installment (60 Months)	PEN 119.59	PEN 119.59	PEN 119.59	PEN 119.59	PEN 119.59	PEN 119.59	PEN 119.59	PEN 119.59	PEN 119.59

Table 9: Loan summary: interest rate subsidy scenario (15 percent interest rate subsidy)

Loan Summary									
Actual Housing Conditions	Unsafe			Requires Improvements			Satisfactory		
Tercile	T1	T2	T3	T1	T2	T3	T1	T2	T3
Investment	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48
Loan Amount without Subsidy	PEN 4,431.58	PEN 4,431.58	PEN 4,431.58	PEN 4,431.58	PEN 4,431.58	PEN 4,431.58	PEN 4,431.58	PEN 4,431.58	PEN 4,431.58
Interest Rate Subsidy (%)	15%	15%	15%	15%	15%	15%	15%	15%	15%
Down Payment form Households	PEN 1,107.90	PEN 1,107.90	PEN 1,107.90	PEN 1,107.90	PEN 1,107.90	PEN 1,107.90	PEN 1,107.90	PEN 1,107.90	PEN 1,107.90
Total Subsidy per House	PEN 1,609.14	PEN 1,609.14	PEN 1,609.14	PEN 1,609.14	PEN 1,609.14	PEN 1,609.14	PEN 1,609.14	PEN 1,609.14	PEN 1,609.14
Total Subsidy per AF	PEN 11,462.63	PEN 11,004.12	PEN 10,087.11	PEN 35,763.41	PEN 35,304.90	PEN 36,221.91	PEN 1,834.02	PEN 2,751.03	PEN 3,209.54
Monthly Household Installment (60 Months)	PEN 103.25	PEN 103.25	PEN 103.25	PEN 103.25	PEN 103.25	PEN 103.25	PEN 103.25	PEN 103.25	PEN 103.25

Table 10: Loan summary: down payment subsidy scenario (PEN 1,609 down payment subsidy per house)

Loan Summary									
Actual Housing Conditions	Unsafe			Requires Improvements			Satisfactory		
Tercile	T1	T2	T3	T1	T2	T3	T1	T2	T3
Investment	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48
Loan Amount without Subsidy	PEN 3,144.27	PEN 3,144.27	PEN 3,144.27	PEN 3,144.27	PEN 3,144.27	PEN 3,144.27	PEN 3,144.27	PEN 3,144.27	PEN 3,144.27
Interest Rate Subsidy (PEN)	PEN 1,609.14	PEN 1,609.14	PEN 1,609.14	PEN 1,609.14	PEN 1,609.14	PEN 1,609.14	PEN 1,609.14	PEN 1,609.14	PEN 1,609.14
Down Payment form Households	PEN 786.07	PEN 786.07	PEN 786.07	PEN 786.07	PEN 786.07	PEN 786.07	PEN 786.07	PEN 786.07	PEN 786.07
Total Subsidy per House	PEN 1,609.14	PEN 1,609.14	PEN 1,609.14	PEN 1,609.14	PEN 1,609.14	PEN 1,609.14	PEN 1,609.14	PEN 1,609.14	PEN 1,609.14
Total Subsidy per AF	PEN 11,462.63	PEN 11,004.12	PEN 10,087.11	PEN 35,763.41	PEN 35,304.90	PEN 36,221.91	PEN 1,834.02	PEN 2,751.03	PEN 3,209.54
Monthly Household Installment (60 Months)	PEN 95.12	PEN 95.12	PEN 95.12	PEN 95.12	PEN 95.12	PEN 95.12	PEN 95.12	PEN 95.12	PEN 95.12

Table 11: Loan summary: buy-down subsidy scenario (initial instalment of PEN 95.40, with annual increase of 2.07 percent)

Loan Summary									
Actual Housing Conditions	Unsafe			Requires Improvements			Satisfactory		
Tercile	T1	T2	T3	T1	T2	T3	T1	T2	T3
Investment	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48
Loan Amount without Subsidy	PEN 4,431.58	PEN 4,431.58	PEN 4,431.58	PEN 4,431.58	PEN 4,431.58	PEN 4,431.58	PEN 4,431.58	PEN 4,431.58	PEN 4,431.58
Interest Rate Subsidy (PEN)	PEN 99.29	PEN 99.29	PEN 99.29	PEN 99.29	PEN 99.29	PEN 99.29	PEN 99.29	PEN 99.29	PEN 99.29
Buy-Down (Income Growth)	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%
Down Payment form Households	PEN 1,107.90	PEN 1,107.90	PEN 1,107.90	PEN 1,107.90	PEN 1,107.90	PEN 1,107.90	PEN 1,107.90	PEN 1,107.90	PEN 1,107.90
Total Subsidy per House	PEN 1,609.14	PEN 1,609.14	PEN 1,609.14	PEN 1,609.14	PEN 1,609.14	PEN 1,609.14	PEN 1,609.14	PEN 1,609.14	PEN 1,609.14
Total Subsidy per AF	PEN 11,462.63	PEN 11,004.12	PEN 10,087.11	PEN 35,763.41	PEN 35,304.90	PEN 36,221.91	PEN 1,834.02	PEN 2,751.03	PEN 3,209.54
Monthly Household Installment (60 Months)									
Year 1	PEN 99.29	PEN 99.29	PEN 99.29	PEN 99.29	PEN 99.29	PEN 99.29	PEN 99.29	PEN 99.29	PEN 99.29
Year 2	PEN 101.34	PEN 101.34	PEN 101.34	PEN 101.34	PEN 101.34	PEN 101.34	PEN 101.34	PEN 101.34	PEN 101.34
Year 3	PEN 103.44	PEN 103.44	PEN 103.44	PEN 103.44	PEN 103.44	PEN 103.44	PEN 103.44	PEN 103.44	PEN 103.44
Year 4	PEN 105.58	PEN 105.58	PEN 105.58	PEN 105.58	PEN 105.58	PEN 105.58	PEN 105.58	PEN 105.58	PEN 105.58
Year 5	PEN 107.77	PEN 107.77	PEN 107.77	PEN 107.77	PEN 107.77	PEN 107.77	PEN 107.77	PEN 107.77	PEN 107.77

Table 12: Summary of subsidy scenarios

	Baseline Scenario	Community Mortgage Scenario	Interest rate Subsidy (15%)	Down payment Subsidy (PEN 1,609)	Buy-Down Subsidy (2.07% Y. Increase)
Investment	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48
Interest Rate	30%	23%	30%	30%	30%
Loan Term	5 Years	5 Years	5 Years	5 Years	5 Years
Loan	PEN 4,431.58	PEN 4,431.58	PEN 4,431.58	PEN 3,144.00	PEN 4,431.58
Household Down Payment	PEN 1,107.90	PEN 1,107.90	PEN 1,107.90	PEN 786.07	PEN 1,107.90
Monthly Installment	PEN 134.07	PEN 119.59	PEN 103.25	PEN 95.12	PEN 99.29
Yearly Increase on Monthly Installment	–	–	–	–	2.07%
Total Amount Disbursed by each Household	PEN 9,151.82	PEN 8,283.46	PEN 7,302.79	PEN 6,493.34	PEN 7,317.00
Subsidy (NPV)	PEN 147,638.67	PEN –	PEN 147,638.67	PEN 147,638.67	PEN 147,638.67
Houses able to pay (322 in total)	102	110	122	125	124

Table 13: Summary of subsidy scenarios, with community mortgage scenario as baseline

	Baseline Scenario	Interest rate Subsidy (15.24%)	Down payment Subsidy (PEN 1,609)	Buy-Down Subsidy (2.07% Y. Increase)
Investment	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48	PEN 5,539.48
Interest Rate	23%	23%	23%	23%
Loan Term	5 Years	5 Years	5 Years	5 Years
Loan	PEN 4,431.58	PEN 4,431.58	PEN 3,144.00	PEN 4,431.58
Household Down Payment	PEN 1,107.90	PEN 1,107.90	PEN 786.07	PEN 1,107.90
Monthly Installment	PEN 119.59	PEN 88.78	PEN 84.85	PEN 85.37
Yearly Increase on Monthly Installment	–	–	–	2.07%
Total Amount Disbursed by each Household	PEN 8,283.46	PEN 6,434.43	PEN 5,877.23	PEN 6,446.35
Subsidy (NPV)	PEN –	PEN 147,638.67	PEN 147,638.67	PEN 147,638.67
Houses able to pay (322 in total)	110	130	131	130

4.3 Funding and Subsidy Scenarios

How to make the best use of subsidies? This is a question that policymakers have debated for ages—and as expected there is no correct answer. Nevertheless, there are at least two principles that almost all policymakers agree on: that subsidies should be as low as possible to achieve their object, and that subsidies should be targeted to those who need them. How then should these principles be incorporated into a subsidy scheme that promotes adequate housing for the inhabitants of José Carlos Mariátegui?

Mixing subsidies is not always the best idea; it tends to confuse policymakers. Based on the assumptions we have made for this model and the summary of results in Table 12, the down payment subsidy scenario seems like the most beneficial form of subsidy for improving housing in José Carlos Mariátegui. With the same subsidy amount (PEN 147,638, or $44,291), the down payment subsidy is the one that is able to reduce by the largest percentage the household down payment, the monthly repayment instalments, and the total amount disbursed by each household over the entire course of the loan (summing up interests and amortizations). It also has the advantage of increasing the percentage of houses able to afford the loan, as measured against the monthly wealth proxy.

Yet these results do not necessarily mean that the down payment subsidy is the scenario that should be applied. Policymakers will want to take many other factors into consideration, such as the following examples:

- Borrower's preferences. Borrowers might prefer paying a smaller amount at the beginning of the loan, a factor that would make the buy-down subsidy preferable.

- Market terms. The interest rate on a savings account might be significant and thus accrue a benefit to subsidies that are not disbursed all at once (such as the interest rate subsidy or the buy-down subsidy).

- Moral hazard on the part of beneficiaries. Beneficiaries might make riskier decisions in their daily lives that could translate in higher default rates on loans when a large portion of the money has already been invested in their houses, as in the case of a down payment subsidy. If there is a chance that inhabitants could be prone to moral hazard, subsidies such as the interest rate subsidy or the buy-down subsidy could be a better option.

- Political risk. If the political situation is unstable or if the government has the ability to discontinue subsidies for any reason, programs that provide loan or interest rate subsidies may be subject to abrupt cancellation. Some subsidies, such as the down payment subsidy, mitigate political risk because they are paid out in full at the beginning of the loan.

- Economic perspectives. If the economic outlook is highly uncertain and full of risks, the cost of financing might increase. In this case, it may be better to disburse the loan before the financing costs increase, in which case the down payment subsidy would be preferable.

The factors just mentioned shape the different type of preferences that the various stakeholders might have regarding a subsidy. Stakeholders' preferences constitute an essential element of the strategic use of subsidies. But there are three other strategic considerations that can shape policymakers' decisions on which subsidy to choose for improving housing in José Carlos Mariátegui.

The first is the familiarity that the inhabitants, the government, and the participating financing institutions have with a particular agrupación familiar. The agrupación familiar will serve as an intermediary between all groups of stakeholders and act in their best interests. This will enable inhabitants to pay a lower interest rate, which means that financing their investments will be cheaper. From the government's perspective, this means that outlays for subsidies will be smaller. Finally, for financing institutions, the collective delivery and social collateral will mean a smaller risk of default.

Efforts to formalize the role of agrupaciones familiares is one way of ensuring that subsidies cost less and are better targeted to those in need. As shown in Table 13, where the community mortgage scenario is compared with the other scenarios, the total cost of a loan to households is reduced by approximately 10 percent, and approximately 6 percent more households can afford to repay their loans. These are not negligible benefits.

The second strategic consideration that can shape the decision on which subsidy is the most appropriate in José Carlos Mariátegui is the possibility of upgrading homes incrementally. This can allow the loan to be altered according to the economic capacity of the borrower and the priority needs of the housing unit. In this report, nine different categories for households were established: houses in unsafe conditions occupied by people in the first (lowest) wealth tercile, houses in unsafe conditions occupied by people in the second (middle) wealth tercile, and so on up to houses in satisfactory conditions occupied by people in the third (highest) wealth tercile. But many more categories could be considered based on a greater availability of information about housing conditions and personal characteristics of the inhabitants. This difference in the needs of specific households can be solved by providing loans

that fit the economic conditions of the individual household; that is, no household will necessarily require a loan that allows an initial investment of PEN 5,539 ($1,662), as the scenarios in this report assumed. This means, for example, that an initial loan could be provided for households to invest in the provision of adequate public services—a loan that could be for a much shorter term than 5 years and that could be obtained at an interest rate much lower than the 30 percent rate in our scenarios. Any of these conditions can vary according to the needs and repayment capacity of the households.

Incremental upgrades of individual houses can provide several important benefits. First, it can significantly reduce the cost of subsidies to the government, or even make upgrades possible without requiring subsidies at all. Second, the financial institution can benefit because it will be providing a loan that is not larger than what the households can afford, thereby reducing the risk of default. Finally, households will benefit not just from the actual upgrades they will be able to undertake, but by being able to access the services of financial institutions. Smaller loans and shorter terms will allow more households to begin building a credit history with financial institutions that can, in the future, allow the households to acquire debt under more favourable terms. (A secondary benefit is that the institutions providing subsidies will be able to reduce their subsidies over time.) An example of a successful incremental home improvement scheme, in Parivartan, India, is described in Box 3. However, incremental upgrades are not without downsides. For example, the pace at which the upgrades will be completed will be much slower and will occur unequally; households with higher income will be able to upgrade their houses faster while poorer households fall behind.

Box 3: Incremental Housing Upgrades (Parivartan, India)

In India, workers in the informal economy are left unprotected due to a lack of access to social security and financial tools, such as banking services. This is mainly because the different tiers of government have failed to address the link between urbanization, the lack of formalization of the economy, and the increasing insecurity of income and housing. For their part, financial institutions are less interested in providing financial and social security products to informal workers because of their unpredictable income and lack of conventional collateral.

To address this gap in the urban informal economy, the Self-Employed Women's Association (SEWA), a network of low-income, independently-employed female workers, was established in 1971 in the state of Gujarat. SEWA accepted deposits and provided credit to members who were likely be deemed unworthy for credit by traditional lenders. Since then, over 44 percent of the money borrowed has been used for the purpose of repairing or upgrading the family home. For home-based workers, which include a large number in the informal economy, this program has translated into women spending more time at productive work and provided easier access to water, safer storage for stocks, and better equipment.

Municipal corporations and NGOs such as SEWA collaborate closely to upgrade areas with substandard infrastructure and housing. NGOs mobilize households and help collect savings for the households' contributions toward the cost of infrastructure. Municipal corporations pay 90 percent of the cost of shared facilities to overcome negative externalities and to make the market viable. Households are required to make a nominal co-payment, which ensures buy-in and is an important tool for assessing the capacity of households to repay loans for subsequent home improvements.

An initial loan instalment of $30 is given to the households for home improvements. After households have repaid this loan, they are eligible for a second instalment of about $75, then a third of about $150, and so on until the sixth cycle, which is equal to about $800. The success of SEWA—demonstrated by its high repayment rate (greater than 95 percent in the first year)—shows that the insecurity arising from a lack of steady income and conventional collateral can be mitigated by a flexible system of checks and balances that revolve around the close relationship it maintains with its members.

The third strategic consideration that policymakers must take into account is that housing upgrades should not be thought of as isolated initiatives of individual households. The economic development of an entire area—through the creation of new businesses and better-paying jobs—should be undertaken simultaneously with the introduction of a financial scheme for upgrading housing. The promotion of new economic activity can be what enables households to earn enough income to have the means to pay for upgrades to their housing units. From the government's perspective, an increase in employment and wages would reduce the amount of subsidies required for households to afford loan repayments, while higher-earning households would present financial institutions with borrowers who are less at risk of default, which will in turn would lead to loans with lower interest rates.

Even a traditional private company looking for profit can be involved in this process. Public-private partnerships between a government agency and private-sector company can be used to finance, build, and operate any kind of project in the public space, including public transportation networks, parks, and convention centres. Financing a project through a public-private partnership can allow a project to be completed sooner or make it a possibility in the first place. This kind of arrangement is typically used when a city government is heavily indebted but a private enterprise is interested in funding the project's construction in exchange for a share of the operating profits once the project is operational. In a public-private partnership, financing the development of the area like José Carlos Mariátegui would be left to private companies, thereby reducing the financial burden on public institutions, while many of the benefits would accrue to the inhabitants. The rebuilding of a public market space in Mandaluyong, Philippines is just one example of how private companies have been involved in the development of an area that would have otherwise been hampered by a lack of public resources (see Box 4).

Box 4: Public-Private Partnership (Mandaluyong, Philippines)

In 1991, the main public market in the city of Mandaluyong, in the Philippines, was destroyed by a major fire. In the immediate aftermath, the government allowed displaced vendors to temporarily set up stalls along the area's roads and sidewalks. This led to serious traffic congestion and sanitation problems, and rebuilding the public market became a high priority for the municipality. However, the local government faced enormous difficulty financing the construction due to the estimated cost of 50 million pesos and interest rates averaging 18 percent per annum. The municipality was also concerned that if it relied too much on raising stall owners' fees to cover its costs, the stall owners would pass on the increased costs to their low-income customers.

After much consideration, the municipality decided that its best option was to build the public market through a public-private partnership using the build-operate-transfer model. A business consortium of several private sector companies was formed to develop the project under the collective name Macro Funders and Developers (MFD). Under the arrangement, MFD built a seven-story commercial centre called The Market Place, with a public market structure on the ground floor. MFD then transferred the public market to the local government, which then constructed the stalls inside the market. In exchange for building the market structure, MFD was given the right to develop the space above the public market by constructing a commercial complex and operating it for the next 40 years, after which the complex would be transferred to the municipal government. The local government provided the use of the land for free and did not share in any of the revenues generated from the commercial complex.

Nevertheless, the municipality realized several financial and non-financial benefits from the project. First, it was able to provide a modern public market at minimum cost. Second, it was able to generate incremental revenues through an increase in tax collections. The municipality conservatively estimates that it will collect between 10 and 20 million pesos in business and entertainment taxes. Third, the land value of the public market has appreciated substantially. Fourth, with the vendors relocated into this modern facility, traffic congestion was reduced in the streets and sanitation problems were resolved. Finally, there was increased economic activity throughout the area, with over 600 new jobs created by The Market Place's many new businesses.

To summarize, many different elements will shape the decision on how to choose which type of subsidy program should be provided. But there are also other feasible policy options—including community mortgage programmes, incremental upgrade initiatives, and private-public partnerships—that could further enrich the types of funding and programmes available for improving the housing and economic well-being of the inhabitants of José Carlos Mariátegui.

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5 Conclusions and Recommendations

Even though the area in which José Carlos Mariátegui is located is a high-risk area along the steep slopes of a mountain (in some places as steep as 30 degrees), it is feasible, as described in this report, to devise a financial model to improve the living conditions of the neighbourhood's inhabitants and help them undertake improvements to transform inadequate housing into resilient and safe houses.

This report found that the provision of adequate housing is possible even without full subsidies. Interventions for improving the quality of the existing housing stock are also viable, provided that proper assessments of structural and environmental risks and other hazards are conducted. The feasibility of a loan-based scheme for the improvement of housing in José Carlos Mariátegui is based on 1) the actual financial capacity of the inhabitants of José Carlos Mariátegui to repay the loans and 2) that the interest rates for the loans are high enough to induce private investors such as banks or savings and credit cooperatives to participate in the market.

The transformation of housing in José Carlos Mariátegui will require several actions over an extended period of time. Over the short term, we recommend granting the legal authority to agrupaciones familiares to function as intermediaries between the recipients of housing improvement loans and the commercial and public entities—including commercial banks, the municipality, and SEPADAL—participating in the co-financing scheme. NGOs that are already involved in facilitating housing improvements and sustainable construction should be given additional resources to deal with housing that is in the most environmentally vulnerable and at-risk areas. However, these resources should be contingent on the participation of—and financial and communal contributions from—the NGOs in the co-financing scheme.

Other benefits can be realized in the short term by applying the subsidy schemes described in this report that reduce the interest rates faced by borrowers and by carefully monitoring the programme's progress. Efforts should be made to facilitate the access that people living in José Carlos Mariátegui have to commercial banks in more established neighbourhoods nearby. Also, support and funding should be sought from the regional development banks. Most development banks are preparing programmes for vulnerable settlements like those in Lima, and the Inter-American Development Bank, the World Bank, and even the International Monetary Fund should be involved into this dialogue.

Over the medium and long terms, funds from the agrupaciones familiares can be used to design a land-value capture scheme in more highly formalized areas in less vulnerable areas down the slopes. For example, the construction of a new 8-story building, with two floors set devoted to commercial activities and the remainder for residences, can incentivize people to move from more vulnerable, less safe parts of the neighbourhood. The use of public-private partnerships to drive development like this can also provide jobs and better wages, which in turn allow inhabitants to move into adequate housing or to improve substandard housing. Local economic development strategies that focus on creating jobs in the formal employment sector will pay dividends over the long term: increasing wages will make it easier for residents to qualify for loans or repay loans already taken out, and formal employment will help residents establish financial histories that will enable them to qualify for lower-cost loans in the future.

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Annex 1: Barrios Altos

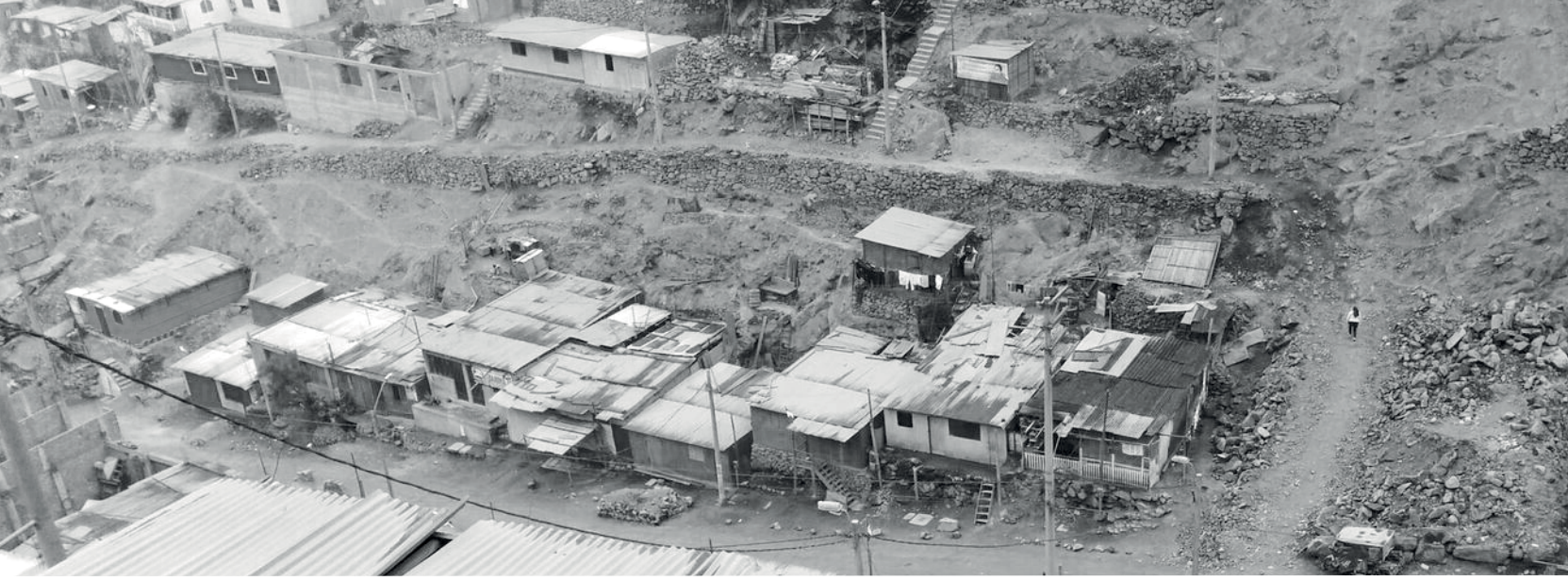
Lima Downtown, Historical Center, July 2016

Lima Downtown, Historical Center, July 2016

Annex 2: : José Carlos Mariátegui

San Juan de Lurigancho District, Province of Lima, July 2016

San Juan de Lurigancho District, Province of Lima, July 2016



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