

Housing on the Horizon
Low-rise, High-density Housing Strategies for Luanda's Expanding Periphery

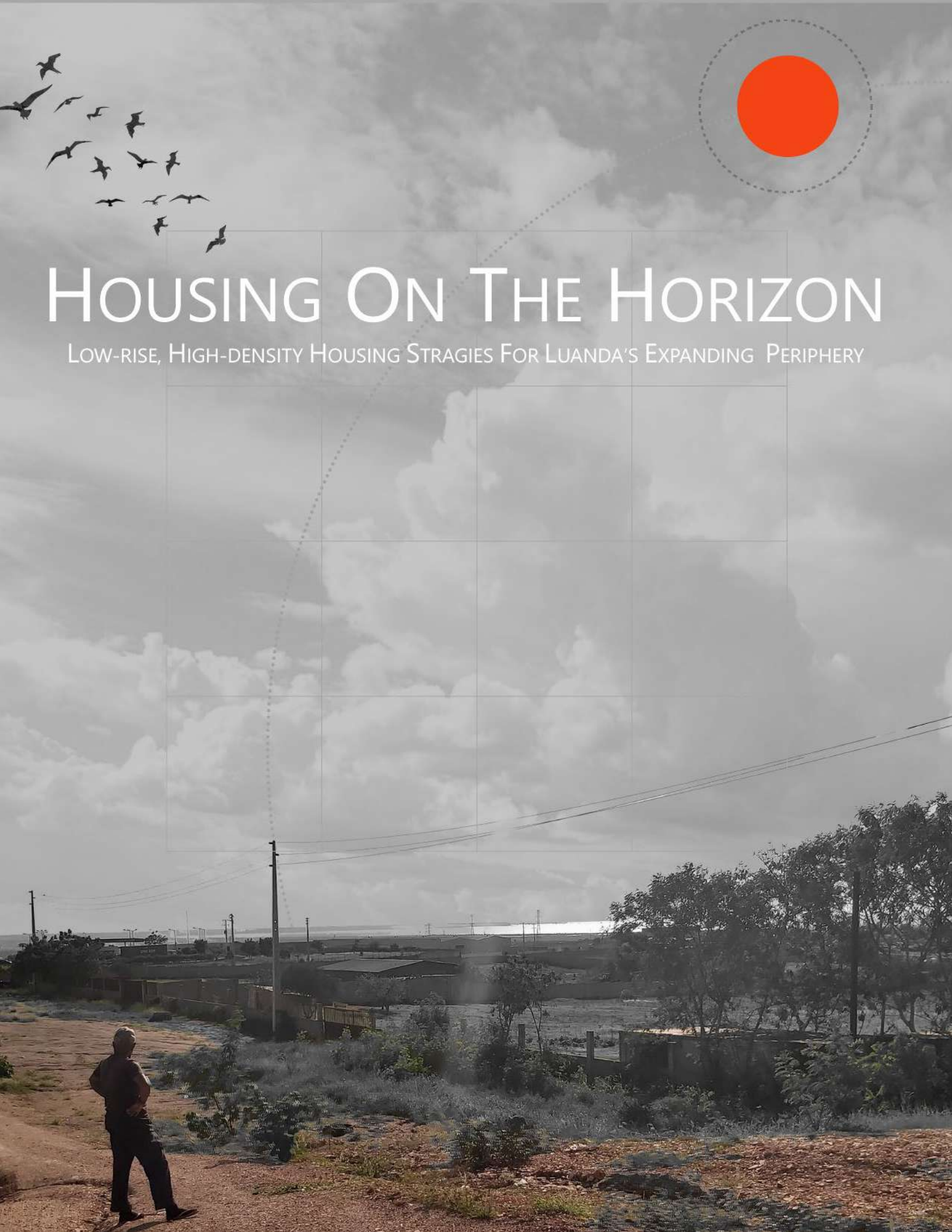
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HOUSING ON THE HORIZON

LOW-RISE, HIGH-DENSITY HOUSING STRAGIES FOR LUANDA'S EXPANDING PERIPHERY

ABSTRACT

Low-rise, High-density Housing Strategies for Luanda's Expanding Periphery

Keywords: Project planning, urban development, low-cost housing, settlements upgrading, community water management and, microfinance.

Urbanization is occurring rapidly in some of the world's most populous and least urbanized areas, notably Asia, and Africa. While just over half of the world's population now live in urban areas, the percentage is expected to increase to about 68% by the year 2050.¹ Already high, demand for housing in African cities is expected to grow exponentially in the upcoming decades.

Angola is one of the fastest urbanizing countries in Africa; 65% of its population currently lives in cities. Rapid ongoing urbanization, coupled with severe housing shortages, has produced sprawling informal settlements throughout the nation's capital, Luanda. The bulk of this housing is self-built at very low densities and limited to one or two stories; the vast majority of residents lack title to the land they occupy. Very little of the city's housing stock benefits from municipal infrastructure (sewers, water, electricity, etc.). Despite sporadic efforts by the government to augment the country's housing stock, severe housing shortages and low-density sprawl have produced inefficient and unsustainable urban patterns.

Addressing this situation involves both the redevelopment of much of Luanda's existing urban fabric and new strategies for the build-out of the city's peri-urban landscapes. By and large, this involves finding ways to build at higher densities,

¹ 68% Of the World Population Projected to Live in Urban Areas by 2050, Says UN | UN DESA Department of Economic and Social Affairs." United Nations. United Nations. Accessed December 20, 2019. <https://www.un.org/development/desa/en/news/population/2018-revision-of-world-urbanization-prospects.html>.

which is difficult to do without access to capital. Good design is also key to the success of high-density development -- at the scale of the building, site, and larger public realm. Strategic architectural interventions, coupled with investment in infrastructure, will produce a more sustainable urban morphology and strengthen housing markets as communities evolve in harmony with the public realm.

This thesis explores strategies and prototypes for sustainable and affordable low-rise, high-density housing on Luanda's periphery. The design portion of the project explores a model neighborhood for a micro-financed, not-for-profit development that offers residents the opportunity to own their units. It is intended as an alternative both to bottom-up, informal settlements and top-down, high-rise, government-sponsored housing.

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I must also extend thanks to Allan Cain, of the Development Workshop, and David Castello, of Habiterra, for allowing me to explore their social housing project as a subject for my thesis. I am sincerely appreciative of their help in securing accommodations in Luanda, finding transportation around the city; and for providing me with the vital advice I needed in order to conduct research. I also thank their collective staff for their support: Jussarra Barreto and Martinho Joaquim, of the Development Workshop and Isolde Sangama, Community Coordinator in Panguila, for helping me carry out fieldwork in Angola. I also thank architect Illidio Diao for sharing vital insights on Luanda's urban growth and neighborhood precedents to explore as part of my visit. It was a pleasure to meet and share their company while abroad.

Finally, I must extend my acknowledgments towards Freed Gomes and my peers at Carleton University for their support and help with the development of my thesis. I also sincerely thank Alumni students, David Anderson and Etai Atias, who's preceding thesis in Angola served as a great foundation for affordable housing and

collaborative work with the Development Workshop. I hope that my work can similarly inspire future research on this subject.

PREAMBLE

I've been long inspired by the transformative impact of design. This has led me to pursue projects involving radically different cultures, economic realities, and lifestyles than my own. Over the course of my architectural studies at Carleton I had the opportunity to travel to Europe, Asia, and South Africa. These trips exposed me to projects geared towards stimulating the livelihood of communities struggling with economic inequality, marginalization, and gentrification. Throughout my studies and travels I have also developed a strong interest in the evolution of cities, the phenomenon of urbanization, large-scale development projects, and the urban histories of developing nations.

After returning from my directed studies abroad in South Africa, I sat in on the thesis presentations of students who were working on the redevelopment of informal settlements in Luanda and was motivated by the subject matter. Having made my interest and experiences known to their supervisor, Professor Benjamin Gianni, he agreed to work with me on a complementary project for this thesis. In concert with the Development Workshop, an NGO based in Luanda, Angola, I was offered the opportunity to work on the design of an actual development project in Panguila, Angola (just outside of Luanda). Having accepted the challenge, I've spent the past eight months researching affordable housing strategies in sub-Saharan Africa and exploring prototypes for high-density, low-rise housing.

There is nothing like returning to a place that remains unchanged to find the ways in which you yourself have altered.

– Nelson Mandela

1.0 INTRODUCTION

Our reactions to the urban landscape are triggered not only by geography and built form but by the psychic character of the environment. In his novel *Invisible Cities*, Italo Calvino explores how ideas and phenomenon form the essential characteristics of our experience of cities. Structured as a fictional travelogue, the book vividly describes cities that do not exist. Each city performs a thought experiment, leveraging socio-political critiques of metropolitan life from the perspective of a traveler. Through the categorical accounts of the cities, Calvino seems to be asking a profound question: How should we live?

Cities both affect and reflect lifestyles. Urban planning and housing have a significant impact on the preemptive storylines of communities. In Luanda, Angola, on which this thesis focusses, urbanity has been forged in a crucible of conflict, economic disparity, and an ongoing rivalry between formal and informal residential neighborhoods. The economic realities of producing housing that is affordable to Luanda's emerging lower-middle class is extremely challenging, as is creating communities of low-cost housing that are socially sustainable over the longer term.

Sustainability has important social, environmental, and economic implications. According to the *Western Australia Council of Social Services*; "social sustainability occurs when the formal and informal processes; systems; structures; and relationships actively support the capacity of current and future generations to create healthy and livable communities."² Therefore, understanding the socio-cultural needs of a community is essential to creating empathetic and sustainable spaces.

² "The Social Link," <http://africasustainability.org/social-sustainability-101/>, Africa Sustainability, n.d.

This thesis explores sustainable housing strategies in collaboration with local communities and NGOs, while dealing with real-world limitations and demands. I am confident that my research will provide insights on how best to develop empathetic and sustainable neighborhoods, i.e., neighborhoods that address the needs and evolving aspirations of residents while contributing to the quality and cohesion of the larger metropolis.



FIGURE 1 MAP OF AFRICA SHOWING THE LOCATION OF ANGOLA AND ITS CAPITAL CITY, LUANDA

SYNOPSIS

A successful M. Arch, thesis typically consists of a site, a program and a set of ideas. In this case the site under investigation is a sloping, 2-hectare (5-acre) plot of land in the town of Panguila. Located on the northern edge of the Luanda Province, Panguila sits approximately 30 km northeast of the center of Luanda, Angola's capital.

The Development Workshop (DW) acquired the site several years ago with the intention of constructing a complex of relatively high-density housing. What the DW envisions is in stark contrast with the bulk of housing in Panguila and elsewhere in Luanda, most of which was self-built at very low densities and occupies land to which residents have no title. Although the DW has constructed single-family-detached housing for purchase in the past, this will be its first foray into multi-unit housing, the construction of which requires significantly more resources up front.



FIGURE 2 ENTRANCE TO DW'S PANGUILA SITE

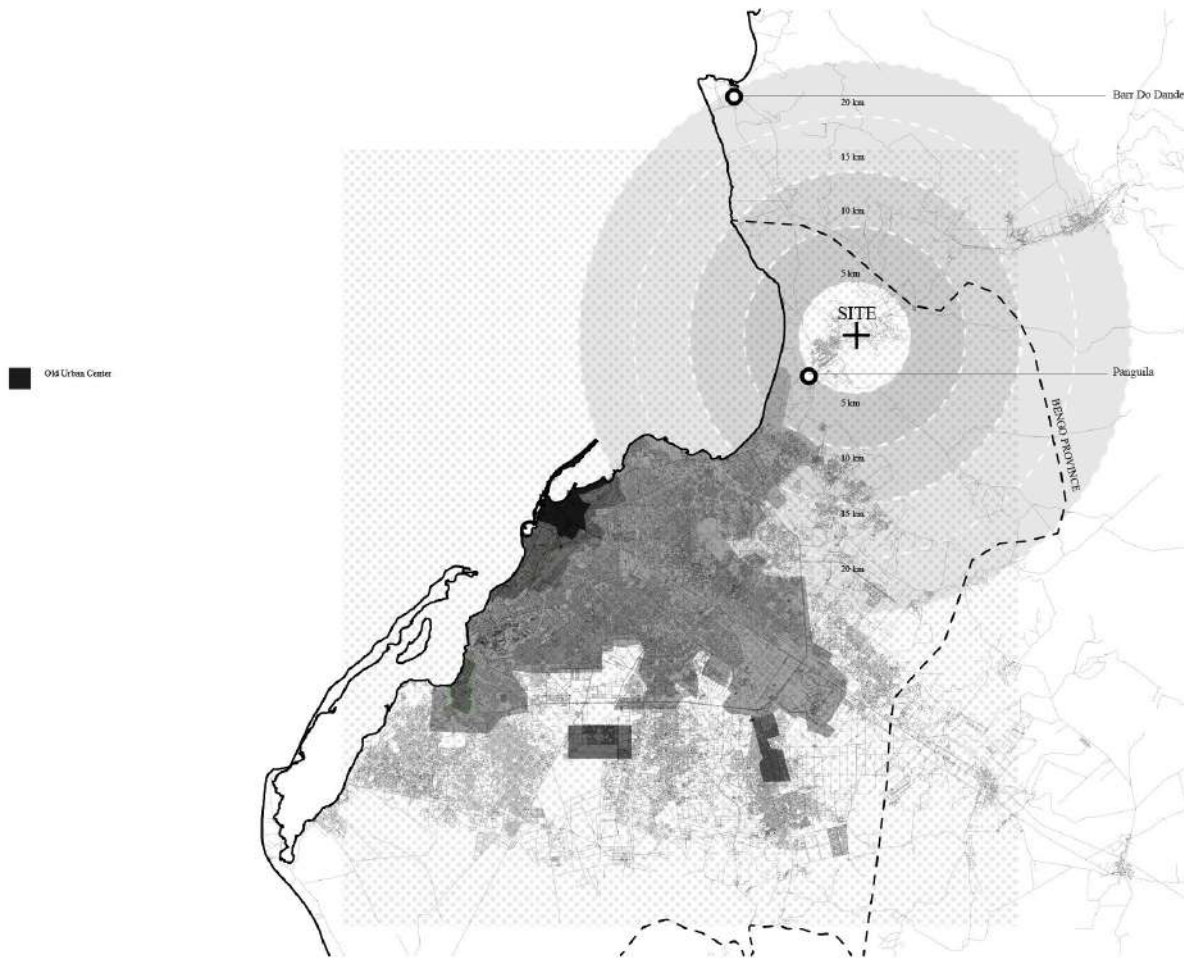


FIGURE 3 MAP SHOWING THE LOCATION OF THE SITE IN THE PROVINCE OF LUANDA

The project in Panguila is intended to provide much-needed housing for purchase by Luanda's emerging lower middle-class, which has been chronically underserved by the formal housing market. The site is located along a main road connecting Luanda to the town of Caxito to the northeast. In addition, plans are underway for a new port in Barra do Dande, further north along the coast (see fig.3). If and when the port is realized, the portion of the DW's site abutting the main road will be able to support commercial activity and higher-end, market-oriented housing.

Since embarking on this project, I have familiarized myself with 1) housing projects of a similar scale and density elsewhere in Africa, 2) microfinancing options, 3) various design strategies, and 4) government-funded housing programs in Angola. In order to better understand the range of issues at play, however, firsthand experience was essential. To this end I visited Luanda early January 2020, where I conducted interviews, undertook neighborhood analyses and market studies to assess demand in relation to form, density and affordability, and explored potential microfinancing models with the director of the Development Workshop and the chair of Habiterria, DW's development arm. The information gathered has helped me to better understand the target market, options for land use, commute durations, needs, and project feasibility.



FIGURE 4 LOOKING TOWARD THE ENTRANCE GATE INTO THE SITE FROM THE MAIN ROAD

2.0 THE CLIENT

2.1 DEVELOPMENT WORKSHOP

The Development Workshop is the oldest NGO in Angola. The organization assists governmental agencies in developing policies, programs for human settlement, and self-help housing³. DW is engaged as a critical partner in the federal government's decentralization program, in participatory planning at the municipal level, and in land tenure reform, while working closely with local community organizations.⁴ DW's current focus is on peri-urban communities where the provision of infrastructure, basic services, and community economic development is a serious challenge.⁵ As noted, I have been in regular communication with the DW's founding director, Allan Cain. Mr. Cain is an architect and specialist in urban project planning. He has over three decades of professional experience in implementing humanitarian projects in developing countries and has participated in several missions for the United Nations, the European Union, and the World Bank. He is also Canada's honorary consul for Angola.

2.2 KIXICASA

The Development Workshop has also piloted Angola's oldest micro-finance institution, KixiCredito, and housing micro-loan project, KixiCasa. The name derives from a combination of "Kixikilas" (informal peer-to-peer lending groups) and "Casa" (home). The micro loans have been used to finance "core" houses for purchase. These houses are designed to enable owners to expand over time as additional

³ Self-Help Housing" involves groups of local people bringing back into use empty properties that are in limbo, awaiting decisions about their future use or their redevelopment. It differs from "self-build housing", which involves constructing permanent homes from scratch. "What Is Self Help Housing?" <https://self-help-housing.org/what-is-self-help-housing/>, Self Help Housing, n.d.

⁴"DW Angola." DW Angola. Accessed December 20, 2019. <http://www.dw.angonet.org/>.

⁵ Ibid.

resources become available. Microfinancing strategies are a key component for subsidizing the prototypical housing that this thesis explores.

2.3 HABITERRA

Habiterra is a design and construction company specializing in providing technology to build cost-effective and stable structures for sustainable communities on an international scale. Habiterra has created emergency shelters and affordable housing, the construction of which does not require specialized workers. The company also researches the development of new buildings systems, material technologies, and prefab unit casting solutions. As noted above, I met and have been in regular contact with the Chair of Habiterra, David Castello.

3.0 BACKGROUND

3.1 RAPID URBANIZATION IN SUB-SAHARAN AFRICA

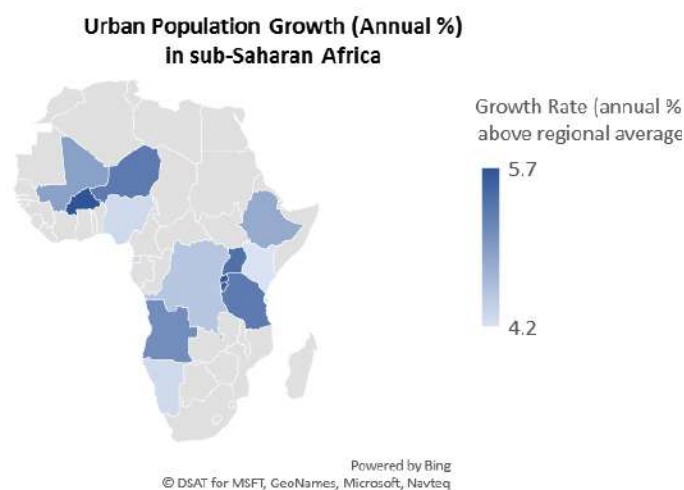


FIGURE 5 URBANIZATION IN SUB SAHARAN AFRICA ⁶

Sub-Saharan Africa (SSA) is one of the world’s fastest urbanizing regions. According to a 2017 report by the United Nations, (SSA) urban populations will double over the next 25 years. The global share of African urban residents is projected to grow from 11.3 percent in 2010 to 20.2 percent by 2050.⁷ A history of neglectful planning, however, coupled with a lack of investment in infrastructure and municipal services, ineffective policies, and the absence of a formal housing market have left the majority of rural-to-urban migrants to fend for themselves.

“Africa today counts 1.35 billion people, of whom only 590 million live in urban agglomerations (43%). According to UN projections the continent urban population is expected to reach 1 billion by 2036. At the moment about half of urban dwellers (300 million) live in slums characterized by high

⁶ Urbanization in Sub Saharan Africa. 2020. Cahare. <http://cahare.sh-original-media.com/african-countries-population-chart>.

⁷ “Urbanization in Sub-Saharan Africa,” accessed March 26, 2020, <https://www.csis.org/analysis/urbanization-sub-saharan-africa>.

densities, lack of basic services, precarious housing, and which are often located in inappropriate, dangerous, flood-prone areas.”⁸

The combination of high-demand, low household income, unavailability of mortgages, corruption, and unresolved land tenure issues have resulted in a chronic lack of housing and a surfeit of informal settlements.⁹ 1- to 2-story self-built and under-serviced homes are the norm in many cities in Sub-Saharan Africa. The speed and scale of urbanization presents severe challenges with respect to housing supply and the provision of infrastructure (roads, schools, public transport, water, sewers, electricity, police services, etc.), resulting in low-density sprawl.

⁸ “TOWARDS SUSTAINABLE AFRICAN CITIES – Global Urban Think Tank,” accessed April 10, 2020, <http://www.urbanistes.info/towards-sustainable-african-cities/>.

⁹ Allan Cain, “Angola Housing Profile - in Africa Housing Finance Yearbook 2019,” 2019, 59.

3.2 ANGOLA

Angola was ranked as Sub-Saharan Africa's third largest economy in 2019.¹⁰ The petroleum business accounts for 33 percent of the country's GDP and 95 percent of its export earnings. Despite the nation's riches, however, wealth resides with a very small minority of the country's 31.8 million citizens. The majority of Angolans are relatively poor. Over 90 percent of the urban population reported to living in meager conditions with limited access to sanitation, water, and electricity. Today, urban residents make up 65.5% of the nation with a rapidly increasing growth rate. This compares to only 35% in 1990.¹¹



FIGURE 6 MAP OF ANGOLA¹²

Angola is now in its fifth year of recession since the economic downturn of 2014, with external public debt reaching 47 billion USD. Included in this debt is the 23 billion USD owed to China for contracts that paid for the country's post-war reconstruction boom.¹³

¹⁰ Allan Cain, "Angola Housing Profile - in Africa Housing Finance Yearbook 2019," 2019, 65.

¹¹ "Angola Urban Population, 1960-2019 - Knoema.Com," Knoema, accessed March 26, 2020, <https://knoema.com//atlas/Angola/Urban-population>.

¹² Map of Angola. November 22, 2019. Highline Tours & Travel. <https://highline.co.za/category/news/>.

¹³ Ibid, 65

3.3 LUANDA

Luanda, Angola's capital, was constructed to accommodate a colonial population of 300,000. As a former Portuguese settlement, Luanda has experienced significant geopolitical, socio-spatial, and population changes. Before achieving independence from Portugal, the nation's late colonial era (1948–1975) was characterized by racial tension, economic exploitation, and an anti-colonial civil rights movement. Urban growth since 1975 can be divided into two key periods: the post-independence civil war (1975–2002), and the post-civil war period (2002 to the present).¹⁴ Rural-to-urban migration in these periods can be distinguished by “push” and “pull.” The country's protracted civil war pushed people into cities while, from 2002 to the present, people have been pulled into cities in search of economic opportunities.

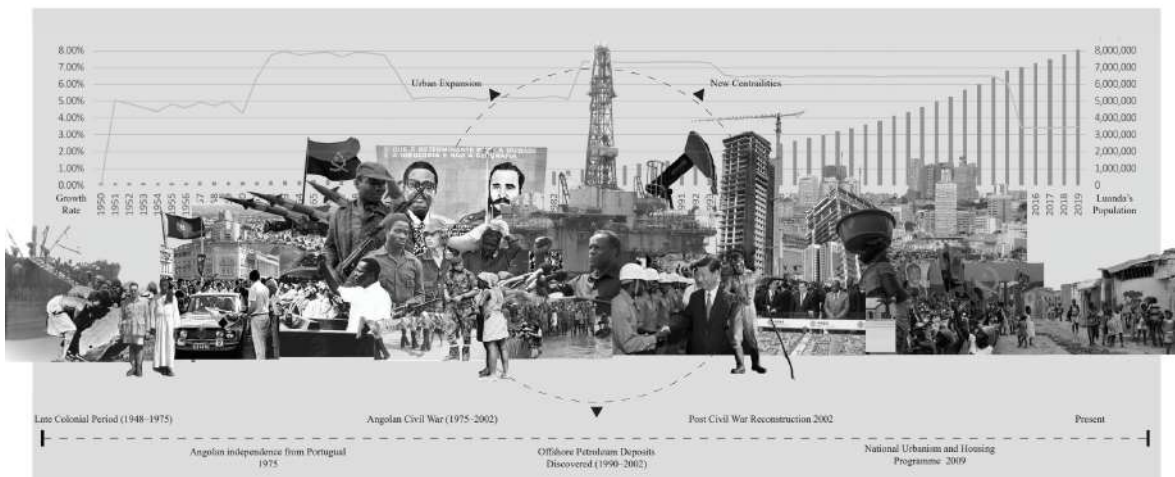


FIGURE 7 TIMELINE COLLAGE OF LUANDA'S HISTORY

¹⁴ Sílvia Leiria Viegas, “Urbanisation and Peri-Urbanisation in Luanda: A Geopolitical and Socio-Spatial Perspective from the Late Colonial Period to the Present,” *Journal of Southern African Studies* 42, no. 4 (July 3, 2016): 595.

3.4 HISTORICAL CONTEXT - DECOLONIZATION AND YEARS OF WAR POST-COLONIAL CIVIL WAR PERIOD (1975–2002)

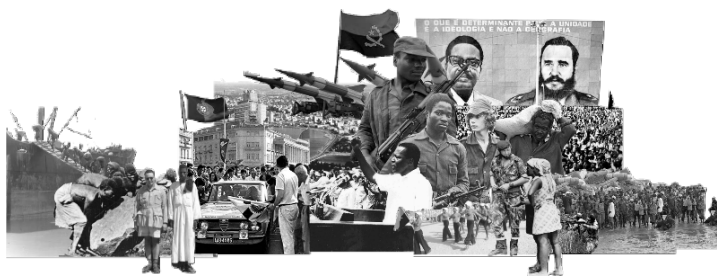


FIGURE 8 COLONIAL TO POST-COLONIAL CIVIL WAR COLLAGE

After achieving independence from Portugal in 1975, authority was handed to an alliance of the three nationalist groups and quickly devolved into a brutal 27-year civil war. The capital city's population swelled dramatically during this period as refugees fled from fighting in rural areas to the relative safety of the big cities and their crowded shanty towns. With their meager resources, refugees built dwellings on land obtained by mostly informal mechanisms, often with little security or tenure. Luanda's population grew from 500,000 in 1975 to approximately 3.5 million by the time the Movement for the Liberation of Angola (MPLA) took power in 2002.¹⁵ As this growth occurred at a time when most resources were being directed to the military, little to no investment was made in urban infrastructure and planning was all but non-existent. The bulk of housing constructed during this period was self-built at low residential densities (approx. 11 units per acre).

¹⁵ Buire, Chloé, *Views of Suburban Luanda: The Move from an Informal Settlement to Social Housing*, Aug. 25, 2015, <https://www.africaresearchinstitute.org/newsite/blog/views-of-suburban-luanda-the-move-from-an-informal-settlement-to-social-housing/>, accessed January 2020.

POST-CIVIL WAR PERIOD (2002 TO THE PRESENT)



FIGURE 9 POST-CIVIL WAR TO PRESENT COLLAGE

With the end of the civil war in 2002, Angola began rebuilding its economy, which expanded rapidly due to oil reserves. This new-found wealth, amidst postwar peace, inspired a major reconstruction boom. Luanda continued to grow due to ongoing rural-to-urban migration and is now home to an estimated 8 million inhabitants: an overall increase of some 5 million inhabitants in the 18 years following the end of the civil war. The cost of living is very high. The city is ranked among the most expensive in the world for expats and there are vast wealth disparities amongst the population. As a result of the 2008 recession and the more recent drop in oil prices, the Angolan currency has depreciated by 72 percent against the US dollar, eroding the purchasing power of the low and middle class. The unemployment rate has also grown by 8.8 percent to 28.8 percent.¹⁶ Post-civil war Luanda is characterized by a pronounced divide between the city planned for the elite and unplanned sprawl, characterized by low-density self-built *musseques*.¹⁷ Modern skyscrapers and

¹⁶ Allan Cain, "Angola Housing Profile - in Africa Housing Finance Yearbook 2019," 2019, 65.

¹⁷ *Musseques*, the Angolan term for slums or self-built squatter settlements, literally translates to "places of red earth."

unfinished towers dominate the city's coastline but also hide the informality that accounts for the bulk of Luanda's urban fabric.

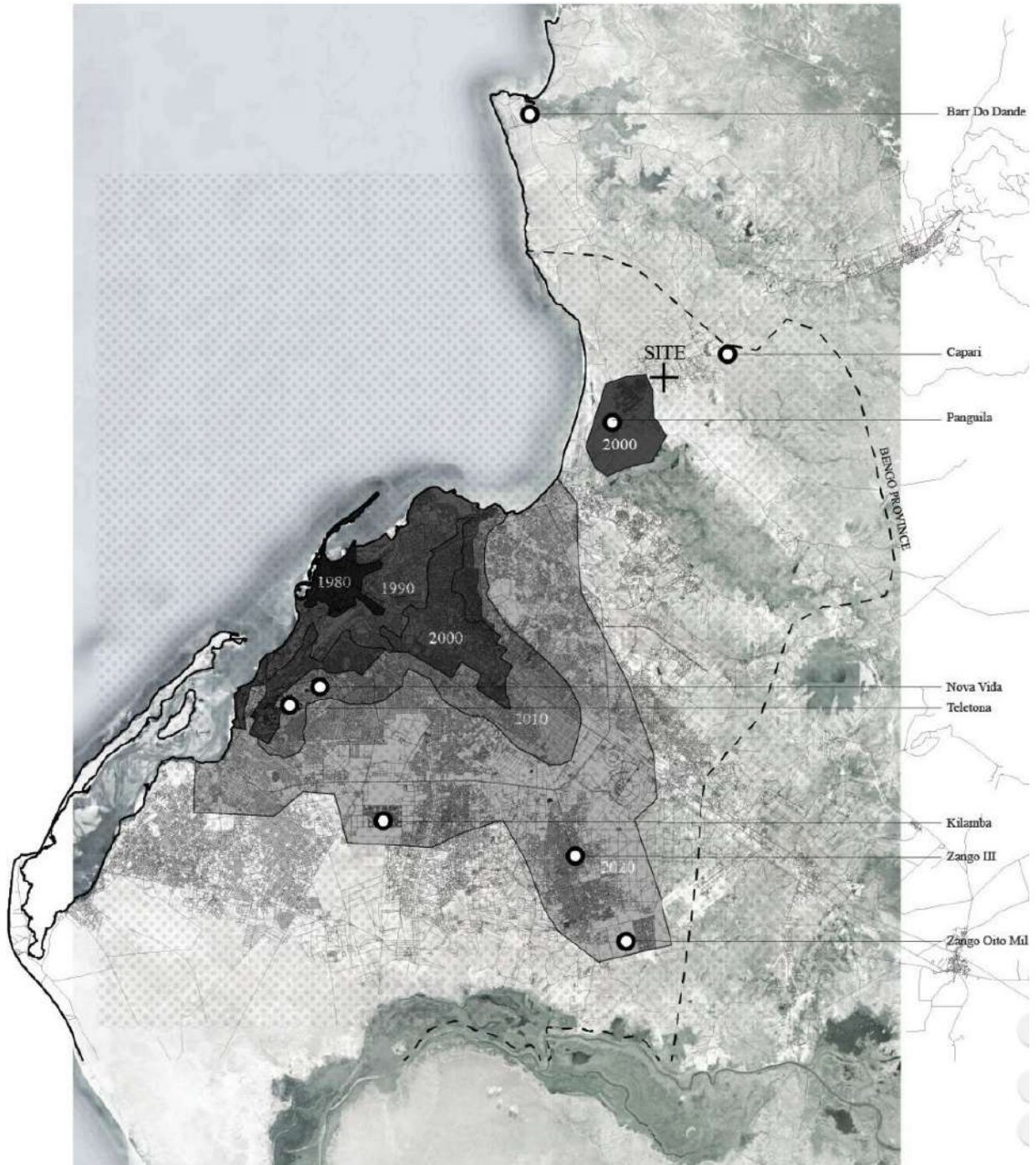


FIGURE 10 MAP OF THE URBAN EXPANSION OF LUANDA SINCE 1980

3.5 HOUSING IN LUANDA

Housing shortages in Luanda were identified as a major issue following the end of the civil war in 2002, even as the city's limits continued to grow. Luanda is largely comprised of one-story, low-density self-built dwellings for which there is little to no municipal infrastructure (water, electricity, sewage, etc.) and on land to which few occupants hold formal title. Consequently, formal home ownership and title to property is rare for most people living in Luanda. Over 60% of transactions in the land market are informal and occupants risk losing housing assets if they become subject to removals or relocation.¹⁸ Although property values have skyrocketed, few residents have benefited as they lack title to the land they occupy. Nor has the municipality been able to levy property taxes on land for which title is ambiguous, severely limiting the resources local governments have available to construct infrastructure and provide services.



FIGURE 11 LUANDA'S FORMAL AND INFORMAL URBAN FABRIC ¹⁹

¹⁸ Allan Cain, "Lessons from China for Angola - Alternatives to African Commodity-Backed Urbanisation," .29,

¹⁹ Luanda's Formal and Informal Urban Fabric. July 7 2017. The Guardian.

<https://www.theguardian.com/cities/gallery/2017/jul/07/luanda-angola-expensive-city-divided-oil-in-pictures#img-4>.

Most formal development projects in Luanda are unaffordable to the majority of residents. Although state-driven housing projects and *centralidades* (centralities)²⁰ have contributed to the nation's formal housing stock in the past decade, they represent only a drop in the bucket. Constructing serviced housing for lower-to middle-class residents requires a great deal of capital in advance. It is a serious challenge to fund urban development in Luanda, partly due to the poverty and the lack of government-backed financing. As noted, lack of land tenure and the high percentage of economic activity that remains informal make it difficult for the government to collect taxes with which to fund or finance public works, housing, and infrastructure. China has been the principal financier of Angolan urban development and reconstruction projects.

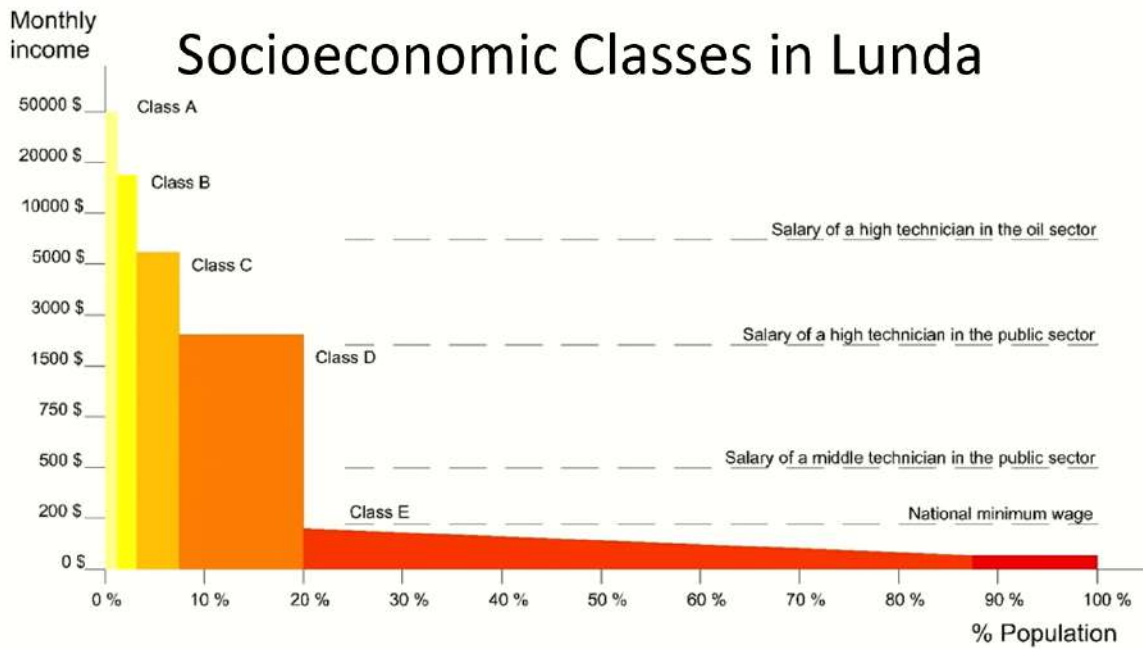
The formal real estate market in Angola is still in its infancy.²¹ Housing development by the private sector has struggled to materialize and what is built is directed to the higher end of the market. Private-sector development for the lower to lower middle demographic is rare given the high level of risk, low return on investment and volatile economic conditions. This has been further compounded by the recession and rising unemployment rates, which eroded the ability of residents to pay rent or meet mortgage commitments.

²⁰ Centralities: the name given to new large-scale housing and urbanization projects undertaken by the government.

²¹ Allan Cain, "(PDF) Angola Housing Profile - Africa Housing Finance Yearbook 2018," ResearchGate, accessed March 27, 2020, https://www.researchgate.net/publication/330083193_Angola_Housing_Profile_-_Africa_Housing_Finance_Yearbook_2018.



FIGURE 12 MAP SHOWING THE CLASS DISTRIBUTION ACROSS LUANDA



* This prototype aims to provide housing for Lower-Middle and upper echelons of Class D

FIGURE 13 GRAPH SHOWING MONTHLY INCOME OF DIFFERENT SOCIOECONOMIC CLASSES IN LUANDA ²²

²² Housing In Angola | Illidio TedxLuanda Luanda. October 26, 2016. YouTube. <https://www.youtube.com/watch?v=sLbPnL8IE5c>

SUMMARY

To summarize, the government has had marginal success in supplying housing that meets the needs of the majority of Angolans. Private real estate markets service the affluent. In the absence of significant changes to the way things are done, housing shortages, informal sprawl, and congestion in Luanda will become increasingly severe. The peri-urban areas around cities like Luanda will continue to expand even if rural-to-urban migration were to end. A study conducted by the Development Workshop shows that population growth in these areas is caused by the migration of the poor from the city center to relatively cheaper peripheral territory. This new migration is no longer driven by war, but by urban poverty.²³ New higher-density and more sustainable development patterns must be implemented in order to address the needs of this growing peri-urban population.

“Of course, The improvement of informal neighborhoods must go hand in hand with the production of new areas of low-cost housing that can accommodate urban growth. This must begin with the creation of large land developments, with basic infrastructure, followed by the sale of plots, either directly to households or to intermediate developers.”²⁴

²³ Allan Cain, “Housing Microfinance in Post-Conflict Angola. Overcoming Socioeconomic Exclusion through Land Tenure and Access to Credit,” *Environment and Urbanization - ENVIRON URBAN* 19 (2007): 363, <https://doi.org/10.1177/0956247807082819>.

²⁴ “TOWARDS SUSTAINABLE AFRICAN CITIES – Global Urban Think Tank.”

3.6 RESEARCH APPROACH

Moving forward there are two challenges facing urban development in Luanda:

1. What do you do with what is already there? How do you address the surfeit of existing informal settlements or *musseques*?
2. In areas that have yet to be built out, how do we build differently? How do we provide viable, higher-density alternatives to self-building for middle- and lower-middle-class Luandans?

Working under Professor Gianni, David Anderson and Etai Atias, former M.Arch. students, explored the redevelopment of informally built neighbourhoods close to the urban core of Luanda,²⁵ addressing the first of the questions posed above. My research represents a complimentary study that focusses on the second question, namely, how to create higher-density housing and positive neighbourhood growth trends on the rapidly urbanizing periphery.

As such, my thesis:

- Addresses problems with land titles by building on land for which title has been established,
- Explores ways to formalize the housing market for middle- to lower-income buyers,
- Explores financing options for those who might want to purchase a house,
- Explores multi-unit housing types through design,
- Investigates ways to build at higher densities with a focus on community, incremental growth, and micro entrepreneurship.

²⁵ The areas around Marconi and the Onze do Novembro neighborhoods in the Cazenga District.

The overall goal of the project is to promote sustainable development patterns in Panguila and to prototype an approach to housing that might be applied elsewhere. Key to the success of this project is the need to anticipate and accommodate change, e.g., as residents become more affluent (benefitting from the increase in the value of their units), as economic activity formalizes, as new transportation options become available, and as the surrounding community grows and transforms. Not only does building at higher densities reduce the cost per unit – providing alternatives to self-building and bringing ownership within reach of a greater spectrum of the population – it is a more sustainable approach than low-density sprawl. At least in the short term, it is important that these new, multi-unit prototypes be designed to accommodate a range of informal economic activity, to sustain a measure of incremental build-out by residents, and to foster social networks. As informal economic activity and social networking are built into the DNA of most middle- and modest-income neighborhoods in Luanda, it is imperative that one not throw out the baby with the bathwater in the move from informal to formal housing.

In this regard it was also important to analyze the history, successes, and shortcomings of the government-sponsored housing projects, new neighborhoods and satellite cities undertaken in recent decades.

4.0 PRECEDENTS

OVERVIEW

While the status quo in Luanda consists primarily of self-built housing, the design proposal aims to create a new kind of built fabric at a higher density with a greater degree of planning. In order to get a sense of how the DW's aspirations compared to other planned multi-unit housing projects in Luanda, I conducted precedent analyses, comparing goals, target demographics, and densities. In so doing I attempted to document the successes and shortcomings of formally built housing in Luanda and elsewhere. As mentioned in the introduction, *Calvino's Invisible Cities* provided a conceptual framework for the more analytical research. In order to gain a perspective on the social dynamics in Luanda and to uncover the philosophies interwoven in the urban fabric, I visited neighborhoods and conducted interviews to observe how people are living, how they've transformed/adapted their housing, the dynamics and synergies between high-end and low-end neighborhoods, how buildings are organized, how buildings relate to streets, the level and nature of economic activity that neighborhoods support, where the residents originate from, and if they are content with their current housing situation. With this as a point of departure I then looked at examples of multi-unit affordable housing in South Africa to inform targets and design parameters.

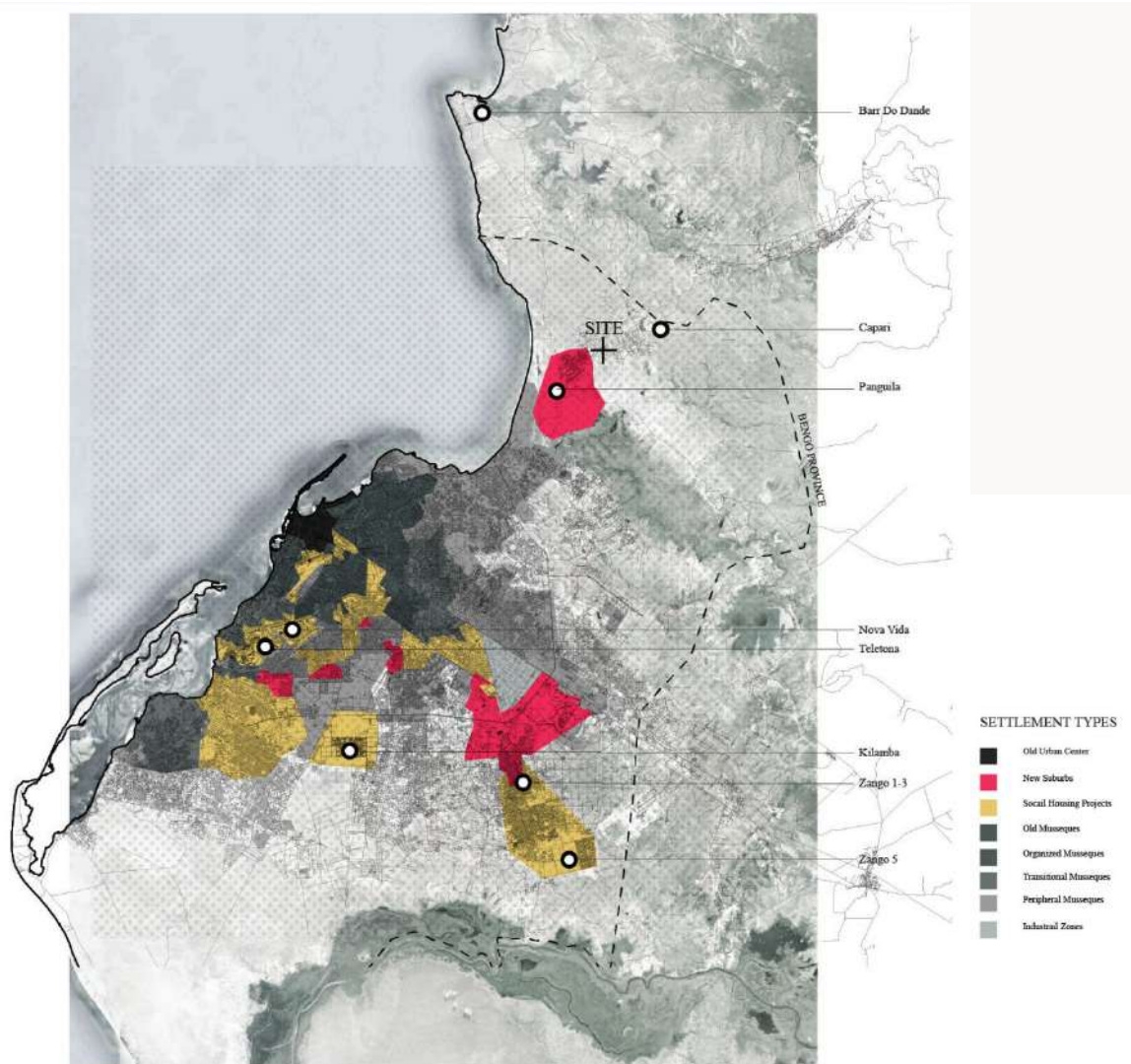


FIGURE 14 SETTLEMENT ZONING MAP

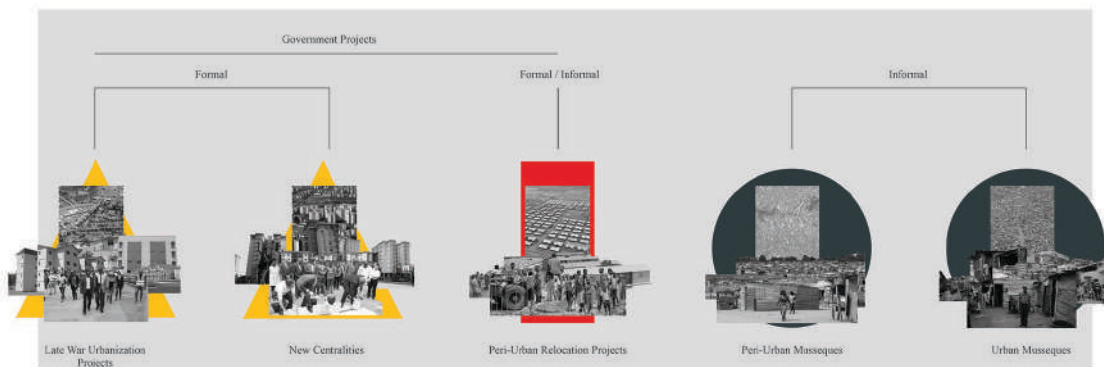


FIGURE 15 COLLAGE OF SETTLEMENT TYPES IN LUANDA

4.1 MUSSEQUES



FIGURE 16 COLLAGE OF MUSSEQUES

URBAN AND PERI-URBAN MUSSEQUES

Musseque is the colloquial term applied to the informal settlements that comprise the bulk of Luanda's urban fabric. Rural-to-urban migration from the mid-1970s onward fueled the exponential growth of *musseques*, most of which lack infrastructure, social services, public spaces, or provisions for sanitation.

While the older, more centrally located musseques tend to be denser than the newer, rural ones, the overall density is still quite low. Some slum areas found near the core are highly irregular, having been built on land that hadn't been subdivided; others were built out on areas where street grids had been laid out in anticipation of neighborhoods that never materialized. Both kinds can be found in the Cazenga District, e.g., the irregular fabric around Marconi and the radial street grid through the Onze do Novembre neighborhood. Despite the living conditions and overall poverty, some residents have the means to upgrade their housing.

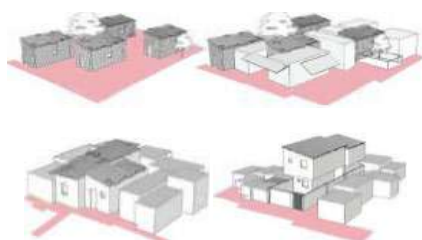


FIGURE 17 EVOLUTION OF MUSSEQUES

The Development Workshop identified two types of post-war musseques in Luanda.

1. *The transitional musseques*: “areas which arose from changes in the old musseques, undertaken to enable them to house more people. Hemmed in by the enveloping city and established irregularly in plots difficult to access; these musseques are located close to many urban resources. Over the previous decade, they had grown vertically into two-story houses and were being targeted by gentrification developers anxious to take over their land, which was increasing in commercial value.”²⁶
2. *The peripheral musseques*: “self-produced areas, recently occupied, consisting of zinc-plate houses located far from the urbanized centre and its opportunities. These unplanned areas, situated on the fringes of the peri-urban area, have invaded rural land and provided somewhere for the more recent waves of migrants in Luanda to live. These peri-urban settlements were difficult to manage and to upgrade. As well as providing the people living in them with a poor quality of life, they undermined the administration’s efforts to run the city.”²⁷

²⁶ Sílvia Leiria Viegas, “Urbanisation and Peri-Urbanisation in Luanda: A Geopolitical and Socio-Spatial Perspective from the Late Colonial Period to the Present,” *Journal of Southern African Studies* 42, no. 4 (July 3, 2016): 605.

²⁷ *Ibid.*, 606.



FIGURE 18 SATELLITE MAPS SHOWING GROWTH OF PERIPHERAL MUSSEQUES NORTH OF PANGUILA

The habits of rural-to-urban migrants have shaped the development of the musseques, resulting in a high number of shared exterior spaces . This organization of dwellings is characteristic of traditional *Kimbo*²⁸ villages. In the Kimbo , homes are



FIGURE 19 A) MUSSEQUE SEMI-PRIVATE COURTYARD B) VILLAGE SEMI-PRIVATE COURTYARD

²⁸ Kimbo -Kimbundu word - describe the ubiquitous mud dwellings seen in *traditional* Angolan *village*. the dwelling and oriented in circle around *jango* (courtyards) with leaders often in the center.

oriented in a circle around a *jango* (courtyard). These courtyards are then broken down into a fractal relationship of semi-private spaces outside the home.²⁹

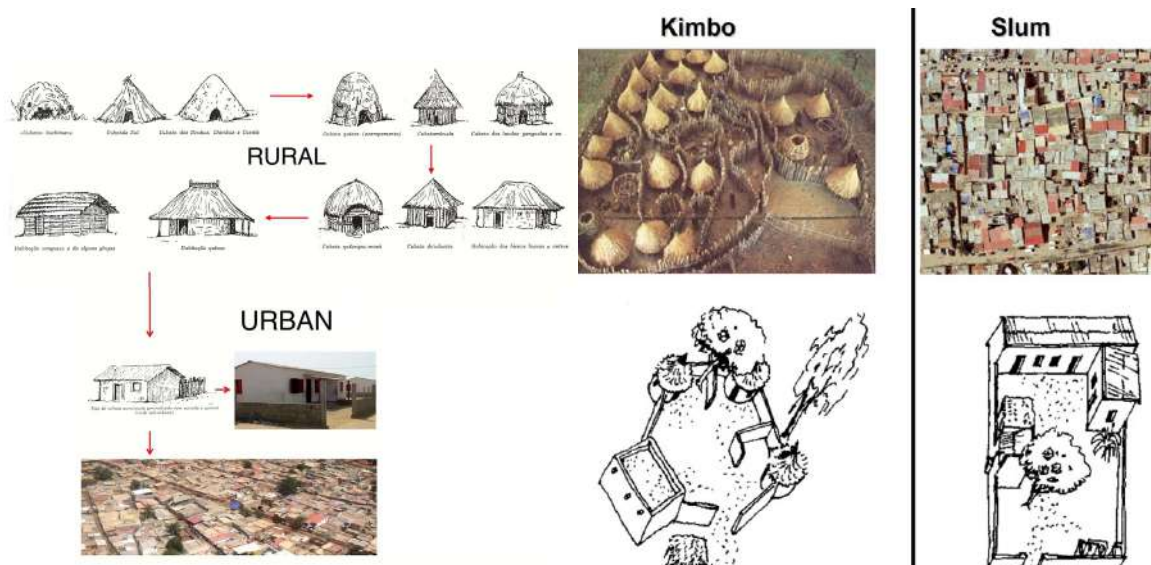


FIGURE 20 TYPOLOGICAL EVOLUTION OF HOUSING – RURAL TO URBAN³⁰

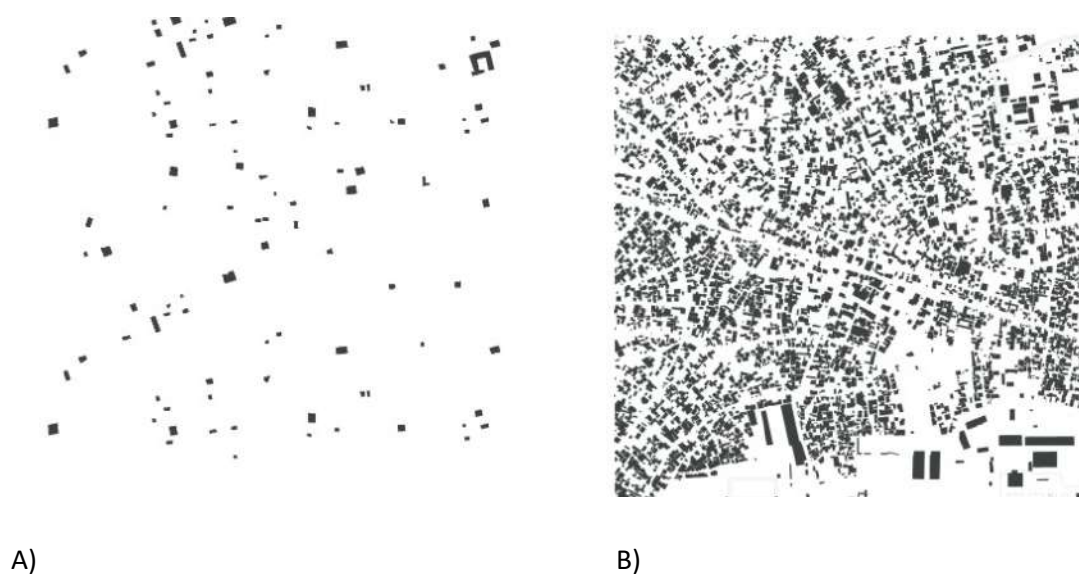


FIGURE 21 FIGURE GROUND SHOWING A) PERIPHERAL MUSSEQUES NORTH OF PANGUILA, B) URBAN MUSSEQUES NORTH OF MARCONI

²⁹ Housing In Angola | Illidio TedxLuanda Luanda. October 26, 2016. YouTube. <https://www.youtube.com/watch?v=sLbPnL8IE5c>
³⁰ Ibid.



FIGURE 22 IMAGE ANALYSIS OF A PERIPHERAL SETTLEMENT IN PANGUILA

SUMMARY

Despite key deficiencies, musseques support a range of economic and social activity. The fabric of courtyards and networks of alleys both foster and accommodate social interaction. The mix of uses is key to their function as resettlement areas. Many settlers work from their living spaces, provide services to their communities, augment their dwellings and, ultimately capitalize on opportune locations to sell goods and earn an income.

4.2 LATE-WAR URBANIZATION & CONDOMINIUMS



FIGURE 23 COLLAGE OF LATE-WAR URBANIZATION AND CONDOMINIUM PROJECTS

As the civil war drew to a close, the government embarked on several large-scale enclaves of multi-story, multi-unit dwellings in Luanda.³¹ The first generation of these were intended for foreign workers, the elite, and decommissioned military officers.³² Communities were located at some distance from the city center and were accessible only by private automobile.³³ In 1996, in partnership with two private Brazilian companies (Odebrecht and Prado Valladares) the government began implementing the *Programa Autofinanciado de Infra-Estruturas de Luanda Sul* (Self-Financed Program for Providing South Luanda with infrastructure).³⁴ The goal was to create infrastructure and construct condominiums outside of the urban core,³⁵ following an “American” suburb model. The Nova Vida and Talatona projects,

³¹ Sílvia Leiria Viegas, “Urbanisation and Peri-Urbanisation in Luanda: A Geopolitical and Socio-Spatial Perspective from the Late Colonial Period to the Present,” *Journal of Southern African Studies* 42, no. 4 (July 3, 2016): 606

³² S. Frias and C. Udelsmann Rodrigues, private condominiums in Luanda: more than just the safety of walls, a new way of living, 344

³³ Ibid, 352.

³⁴ Sílvia Leiria Viegas, “Urbanisation and Peri-Urbanisation in Luanda: A Geopolitical and Socio-Spatial Perspective from the Late Colonial Period to the Present,” *Journal of Southern African Studies* 42, no. 4 (July 3, 2016): 606

³⁵ *Condominiums* in Angola refer to private housing, not necessarily gated but disconnected from the rest of the city. It is colloquialism of the American Suburb model.

south of the city, comprise the majority of these early condominium complexes. It was only after the end of the war in 2002, under a program of national reconstruction, that Luanda started to see a broader dispersion and proliferation of large-scale residential projects, financed and constructed primarily by foreign companies (Chinese, Brazilian, and Portuguese).³⁶ The vast majority of these compounds are surrounded by new and old *musseques*, whose residents work as guards, gardeners, domestic workers, and maintenance teams.³⁷

³⁶ Ibid, 346.

³⁷ Ibid, 351.

NOVA VIDA



FIGURE 24 SATELLITE MAPS SHOWING GROWTH OF NOVA VIDA

The Nova Vida Development, launched in the late 90s, is a public-private housing project located 18 kilometers south of Luanda’s colonial core and constructed over three phases. Nova Vida was Angola’s first attempt at rent-to-purchase housing.³⁸ Plans for the development called for the construction of homes for 30,000 people on a 440-ha site. The first phase comprised of two zones of housing: 1) single-family, fenced, villa-style houses for upper-middle-class Angolan families (university teachers, demobilized military officers and government staff) and Portuguese and Brazilian expats, and 2) a zone consisting of 4-story, multi-unit buildings made available to a wider market at a subsidized price. The second phase which began

³⁸ Allan Cain, “Private Housing Sector in Angola Angola’s Tentative Development of a Private Real-Estate Market,” 2017, 6.

some ten years after Phase 1 was an expansion of the 2nd zone, but with taller, 6-storey apartments.³⁹



FIGURE 25 STREET OF FENCED, SINGLE-FAMILY, VILLA-STYLE HOUSES IN NOVA VIDA



FIGURE 26 VIEW OF PHASE 2 MULTI-UNIT HOUSING IN NOVA VIDA⁴⁰

³⁴S. Frias and C. Udelsmann Rodrigues, private condominiums in luanda: more than just the safety of walls, a new way of living, 353.

⁴⁰ *View of Phase 2 Multi-Unit Housing In Nova Vida*. Aureon Group. Accessed April 3, 2020. <https://www.aureongroup.com/projects/government/nova-vida>.⁴⁰

Nova Vida's phased buildout caused controversy with respect to land acquisition. In the initial phase 231 homes were demolished and occupants were relocated to a neighboring, underserviced informal district (Bairro de Lata) with minimal compensation. Informal settlers were put under threat again during the second phase of the development. Three years later residents of Bairro de Lata were dislodged and re-housed to state-funded relocation neighborhoods on the far periphery of Luanda under the orders of the Council of Ministers' Economic Commission.⁴¹



FIGURE 27 STREET VIEW OF MULTI-UNIT HOUSING IN NOVA VIDA

The second phase of Nova Vida was completed in 2016, followed by Phase 3, which consisted of clusters of low-rise luxury condominium homes enclosed by security walls. The complex, named Cajueiro, is owned by Sonangol (the major national oil company) and unlike the earlier phases, it controls its own sources of water and electricity.⁴²

⁴¹ Allan Cain, "Private Housing Sector in Angola Angola's Tentative Development of a Private Real-Estate Market," 2017, 9.

⁴² S. Frias and C. Udelsmann Rodrigues, private condominiums in luanda: more than just the safety of walls, a new way of living, 353



FIGURE 28 DETACHED SINGLE UNIT CONDOMINIUM HOUSING IN CAJUEIRO⁴³

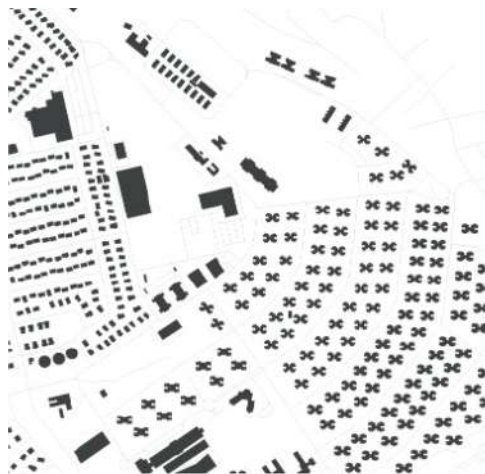


FIGURE 29 FIGURE GROUND OF MULTI-UNIT HOUSING IN NOVA VIDA

⁴³ Angocasa <https://www.angocasa.com>, "Angocasa - O Maior Portal Imobiliário de Angola – Comprar e Vender!," Angocasa, accessed June 4, 2020, <https://www.angocasa.com>.



FIGURE 30 IMAGE ANALYSIS OF (PHASE 2) MULTI UNIT HOUSING IN NOVA VIDA SHOWING KEY ELEMENTS



FIGURE 31 IMAGE ANALYSIS OF STREET OF SINGLE-FAMILY, FENCED, VILLA-STYLE HOUSES IN NOVA VIDA, SHOWING KEY ELEMENTS

TALATONA

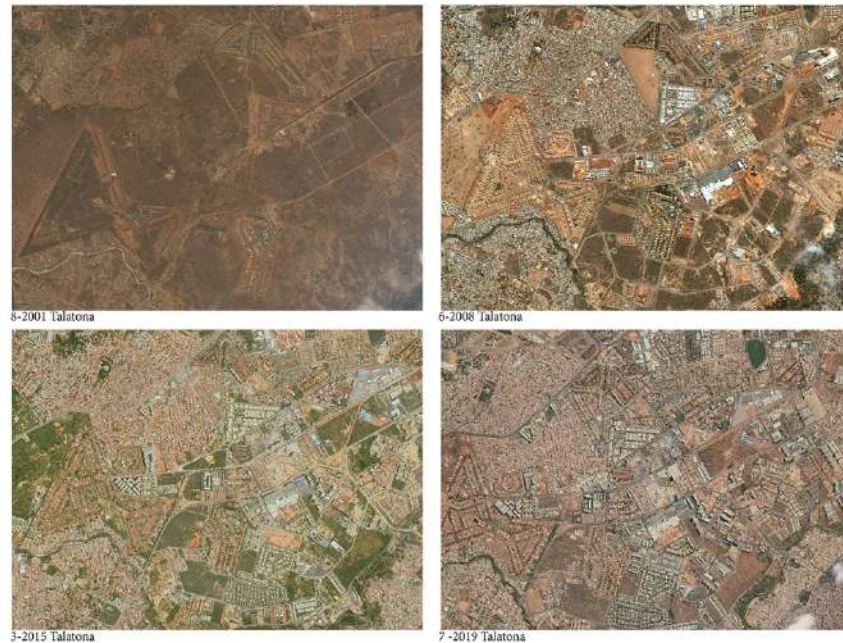


FIGURE 32 SATELLITE MAPS SHOWING THE GROWTH OF NEIGHBORHOODS IN TALATONA

Talatona is an elite residential enclave in the Luanda Sul Region, south of the city. The municipality emerged in the mid-1990s to accommodate wealthy and expatriate residents seeking to avoid the overcrowded urban core. The new roads needed to tie the development with the city centre were constructed in 1996 under the Self-Financed Program for Providing South Luanda with Infrastructure (*Programa Autofinanciado de InfraEstruturas de Luanda Sul*).⁴⁴

⁴⁴ Sílvia Leiria Viegas, "Urbanisation and Peri-Urbanisation in Luanda: A Geopolitical and Socio-Spatial Perspective from the Late Colonial Period to the Present," *Journal of Southern African Studies* 42, no. 4 (July 3, 2016), 606.



FIGURE 33 GATED NEIGHBORHOOD IN TALATONA

Expanding rapidly during the postwar period, Talatona became known for its luxury housing, commercial buildings, gated neighborhoods, and Western style malls with global brand names.⁴⁵ While many of the homes initially sat vacant, the area has recently attracted upper-middle-class Luandans and wealthy residents from other provinces, despite enduring problems with traffic. An apartment in Talatona can cost over \$1.5 million with units valued over 5 million USD.⁴⁶ Talatona exemplifies the elite classes' ability to afford Luanda's luxuries and absorb the high cost of living, largely from a flow of dollars from the oil economy.

⁴⁵ Agnaldo Brito, "Talatona, the Enclave of the Rich in Angola -," *Folha*, May 25, 2010, <https://web.archive.org/web/20180921074046/https://www1.folha.uol.com.br/mercado/740465-talatona-o-enclave-dos-ricos-em-angola.shtml>.

⁴⁶ *Ibid.*



FIGURE 34 GATED NEIGHBORHOOD IN TALATONA

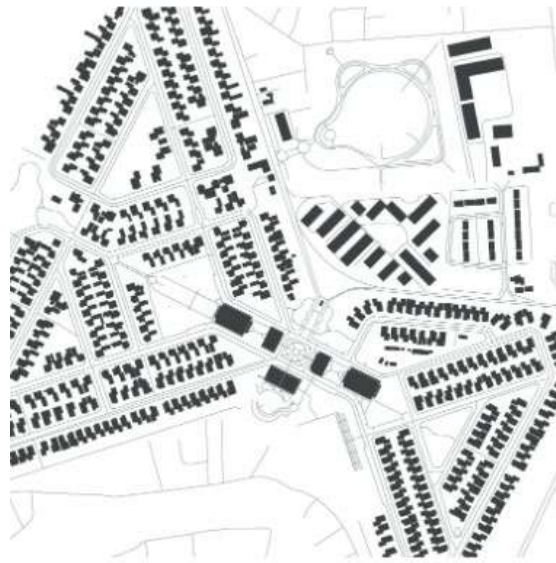


FIGURE 35 FIGURE GROUND OF A GATED NEIGHBORHOOD IN TALATONA



FIGURE 36 IMAGE ANALYSIS SHOWING KEY ELEMENTS OF A NEIGHBORHOOD IN TALATONA



FIGURE 37 IMAGE ANALYSIS DIAGRAM SHOWING KEY ELEMENTS OF A NEIGHBORHOOD IN TALATONA

SUMMARY

The open terraces, generous yards, gated neighborhoods, private parking, and well-maintained roads represent an idealized residential model shaped by affluence in reaction to overcrowding in the urban core. In the initial stages, the Talatona and Nova Vida condominium projects were designed to enable the elite and expat communities to self-isolate in secure, detached suburban settlements. These projects not only represent the first wave of decentralization of the urban core by the upper and middle classes, but also represent a desire for security and comfort. More recently, in the postwar period, the demand for home ownership by the growing middle and upper-middle classes has produced an increased demand for these housing types.⁴⁷

⁴⁷ Sónia Frias and Cristina Udelsmann Rodrigues, "Private Condominiums in Luanda: More than Just the Safety of Walls, a New Way of Living," *Social Dynamics* 44, no. 2 (2018): 344, <https://doi.org/10.1080/02533952.2018.1487750>.

4.3 NOVAS CENTRALIDADES



FIGURE 38 COLLAGE OF NEW CENTRALITIES

In 2009, the government of Angola launched the National Urbanism and Housing Program (PNUH), to address accumulated housing shortages. The goal of the project was to build 1 million homes before 2015, funded by oil-based loans and undertaken by foreign developers.⁴⁸ This program spurred the creation of *Novas Centralidades* (New Centralities/satellite communities) on the periphery of Angola's major cities. As of 2016, however, the PNUH had only delivered 218,418 housing units.⁴⁹ Nova Cidade de Kilamba and Capari are among the satellite cities constructed around Luanda.

⁴⁸ Allan Cain, "Angola Housing Profile - in Africa Housing Finance Yearbook 2019," 2019, 59

⁴⁹ Ibid, 59

NOVA CIDADE DE KILAMBA

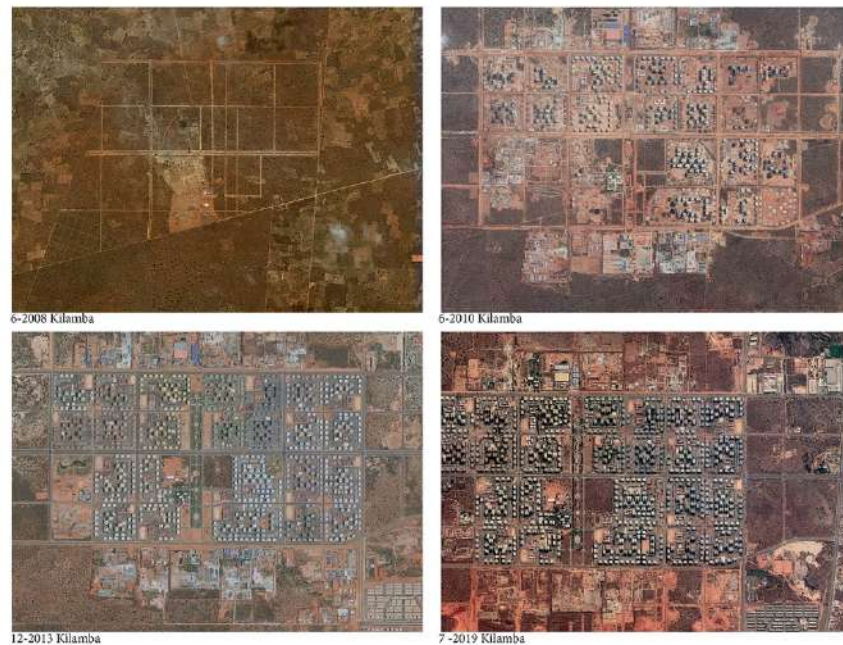


FIGURE 39 SATELLITE MAPS SHOWING THE GROWTH OF KILAMBA

Kilamba represented a new paradigm for government-funded housing developments under the PNUH. The *Nova Cidade de Kilamba* was designed as a self-contained city and was to provide affordable housing for half a million Angolans. Located approximately 20 km south of the center of Luanda, the project spreads over 800 ha, of which 550 ha is built out. It is divided into 24 neighborhoods and comprises of 700 pastel-colored buildings ranging in height from 5 to 11 stories.⁵⁰ Plots of land were set aside for schools, parks, hospitals, sports fields, and other amenities. The first phases of the project included 3,800 apartments, all of which were built by a Chinese developer over a period of 18 months.

⁵⁰“Kilamba.” Kilamba. Accessed December 20, 2019. <https://kilamba-info.com/>.



FIGURE 40 AERIAL VIEW OF KILAMBA⁵¹

In the overpopulated metropolis of Luanda, landlords often require a minimum of six months' rent up front in cash for formal housing. The easier rent-to-purchase scheme for Kilamba was a less demanding proposition for Angolans seeking to escape musseques.⁵² Unfortunately, the initial monthly rent was not affordable for the majority of the population. Similar to Nova Vida, access to housing in Kilamba was initially restricted to civil servants, with the state providing a mortgage in the absence of funds from commercial banks.⁵³ Due to lack of affordability and high percentage of vacancy, Kilamba garnered international attention during its early years and was described by journalists (even today) as an expensive ghost town. This, however, is no longer quite the case. In 2013, President dos Santos ordered

⁵¹ Aerial View of Kilamba. Phantom Urbanism. Accessed April 3 2020. <http://www.phantom-urbanism.com/nova-cidade-de-kilamba.html>

⁵² Chloé Buire, "Views of Suburban Luanda: Banishing the Ghosts from Kilamba," <https://www.africaresearchinstitute.org/newsite/blog/views-of-suburban-luanda-banishing-the-ghosts-from-kilamba/>, Africa

⁵³ Ibid.

that Kilamba be made available and affordable to all Angolans through state-backed mortgages.⁵⁴ Prices for the smallest 3-bedroom units were nearly halved from their initial offering to \$70,000 USD. Demand became so great that queues formed in front of real estate offices and transactions were suspended due to supply shortages after some 18,000 units were sold.⁵⁵ In July 2015, Kilamba was reported to have a population of 80,000 inhabitants with a typical resident being a thirty-year-old, well-educated Luandan, employed in the formal sector, often with a young family.⁵⁶ The size and location of Kilamba, however, have contributed to Luanda's chronic traffic jams as the majority of its residents commute by private vehicles to work in the city center. The 32 km commute can take hours.

Living in Kilamba is a source of pride for its residents, however, the drop in the price of oil in recent years has thrown the Angolan economy into a tailspin. The massive devaluation of the Angolan currency coupled with a rising unemployment rate has resulted in a significant percentage of those living in the centrality not being able to meet their monthly mortgage commitments.

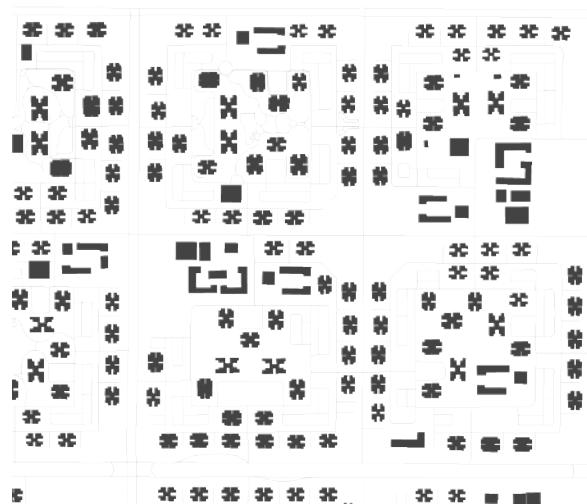


FIGURE 41 FIGURE GROUND OF KALIMBA

⁵⁴ Ibid.

⁵⁵ Ibid.

⁵⁶ Ibid.



FIGURE 42 IMAGE ANALYSIS OF A MAIN STREET IN KILAMBA



FIGURE 43 IMAGE ANALYSIS OF A STREET IN KILAMBA

VILA FLOR

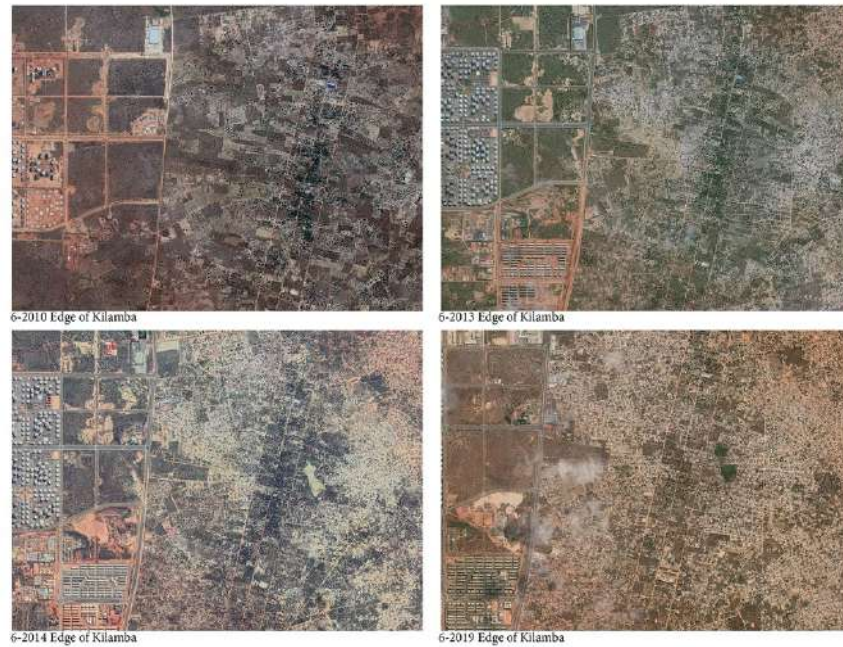


FIGURE 44 SATELLITE MAPS SHOWING NEIGHBORHOOD GROWTH ON THE EDGE OF KILAMBA

Many of the new centralities spawned ad-hoc developments on adjacent lands – attracting lower-income households seeking employment from their well-to-do neighbors and entrepreneurs capitalizing on the absence of goods and services available in the formally built communities. The Vila Flor neighborhoods emerged during the construction of Kilamba’s urban networks.⁵⁷ Most of the formal housing constructed in Vila Flor follows a single-story model akin to Panguila or Zango (described below). Diverse both in structure and with respect to the demographics it supports, many of the houses in Vila Flor sport additions, upgrades, and detached rental units constructed of corrugated metal. Appendix II, includes transcripts of

⁵⁷ Conversations with Illido Daio

interviews with residents who moved to Vila Flor to work on roads for Chinese contractors.



FIGURE 45 IMAGE OF A STREET IN VILA FLOR



FIGURE 46 IMAGE OF A STREET IN VILA FLOR

CIDADE DE CAPARI

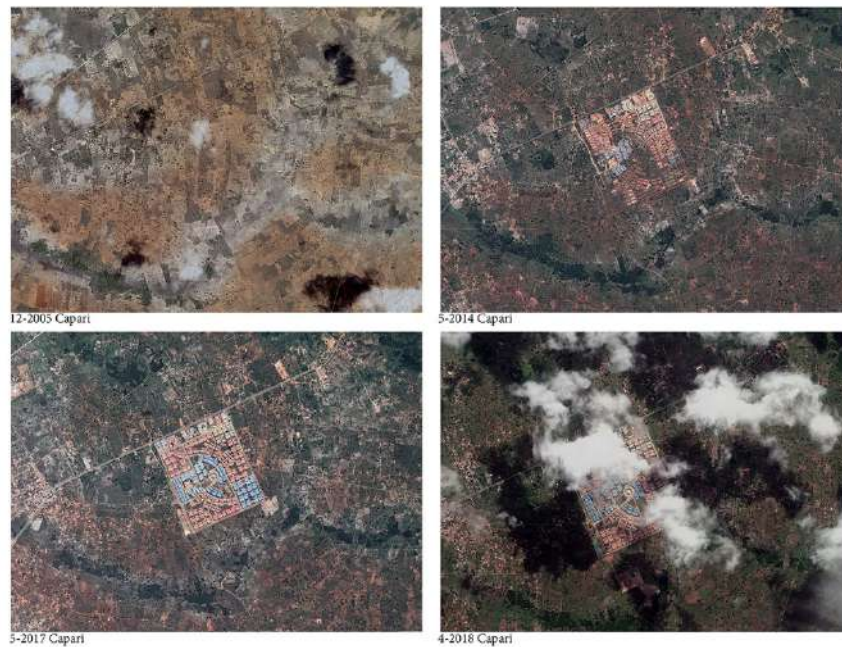


FIGURE 47 SATELLITE IMAGES SHOWING THE GROWTH OF CAPARI

Located northeast of central Luanda, the New Centrality of Capari sits on the boarder of the neighboring Bengo province -- a fifteen-minute drive north of the site under investigation in Panguila. Intended for middle-class Luandans,⁵⁸ the project consists of 4,000 dwellings to accommodate a population of 24,000 on a 90.5-hectare plot.⁵⁹ Capari is subdivided into eleven urban blocks, separated by an internal road network. There is little diversity in the residential buildings which consist primarily of 3-bedroom apartments in two-story buildings. At 44 units per hectare (18 UPA) the residential density is quite low compared to the 150 units per hectare (61 UPA) that the DW has targeted for the site in Panguila.

⁵⁸ Conversations with David Castello

⁵⁹ "»Capari-Bengo Urbanization," accessed April 27, 2020, <https://www.imogestin.co.ao/projecto/centralizado-do-bengo/>.

Despite benefiting from electricity, public lighting, potable water, sanitary and storm sewers, telecommunications infrastructure, and landscaping, Capari suffers from physical and social isolation. Residents lack access to shopping, health-care centers, police stations, fire brigades, secondary schools and employment opportunities. It was recently announced that some unused houses will be repurposed to accommodate missing facilities.⁶⁰ Although Capari is relatively distant from the urban core where many residents work, there is no infrastructure to support intercity and intra-urban transport.



FIGURE 48 IMAGE OF A STREET IN CAPARI

Of the 4,000 apartments built in Capari, only 1,600 are inhabited. Blocks of vacant units have been looted and vandalized by the neighboring populations. The most damaged sectors have been enclosed in walled barricades that run through paved streets and segregate them from the populated blocks. Doors are missing and windows are broken in many of these empty apartments.

⁶⁰ “Centralidade do Capari ganha posto policial e centro de saúde - Sociedade - Angola Press - ANGOP,” <http://www.angop.ao>, accessed April 27, 2020, http://www.angop.ao/angola/pt_pt/noticias/sociedade/2019/10/44/Centralidade-Capari-ganha-posto-policial-centro-saude,e1cedac4-e4cf-4239-9507-7e3be60a3aff.html.



FIGURE 49 IMAGE OF A STREET IN CAPARI

Despite the challenges, many residents live relatively comfortably in Capari. During my visit to the neighborhood I interviewed a young, stay-at-home mother who shared her day-to-day experiences (see Appendix III). She explained the difficulties residents face in trying to get to work and in obtaining basic essentials. Most residents do not have access to a car and the taxis servicing the centrality are infrequent and unreliable. She noted that many residents have taken to running small businesses out of their apartments, transforming parts of their homes into restaurants, stores, or offering services to their neighbors.



FIGURE 50 FIGURE GROUND OF CAPARI

SUMMARY

Overall, the centralities offer several aspects of good design despite the lack of variety, unaffordable empty apartments, and remote locations. The overall organization of space, access to utilities, and the soundness of the dwellings helps residents feel secure. Residents make use of the wide sidewalks for commerce and open fields for children to play. In addition, there are working traffic lights, maintained lawns, and local schools. Residents also run businesses out of ground-level interior spaces and there is ample parking. Finally, porches on the upper floors help connect residents to the outdoors.



FIGURE 51 IMAGE ANALYSIS OF A STREET IN CAPARI



FIGURE 52 IMAGE ANALYSIS SHOWING KEY ELEMENTS OF A NEIGHBORHOOD IN CAPARI

4.4 RELOCATION SITES

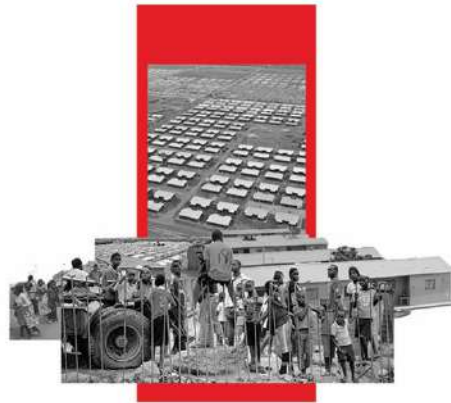


FIGURE 53 COLLAGE OF RELOCATION SITES

Relocation neighborhoods figure prominently in Angola's post-war reconstruction strategy. Houses on the outskirts of the city are often provided free of charge to residents who have been displaced because:

- a. they have settled areas deemed unsafe for living, or
- b. they are living in areas destined for urban redevelopment.

Over the course of the past two decades, a growing number of slum dwellers in "high-risk" areas have relocated to state-sponsored complexes such as Sapú, Projecto Morar, Zango and Panguila, typically located on the far periphery.⁶¹

⁶¹ Claudio Gastrow, "Zango: Plans Unravel - UrbanAfrica.Net," Urban Africa, accessed April 3, 2020, <https://webcache.googleusercontent.com/search?q=cache:gzxxbooVKMIJ:https://www.urbanafrica.net/news/zango-plans-unravel/+&cd=15&hl=en&ct=clnk&gl=ca>.

ZANGO

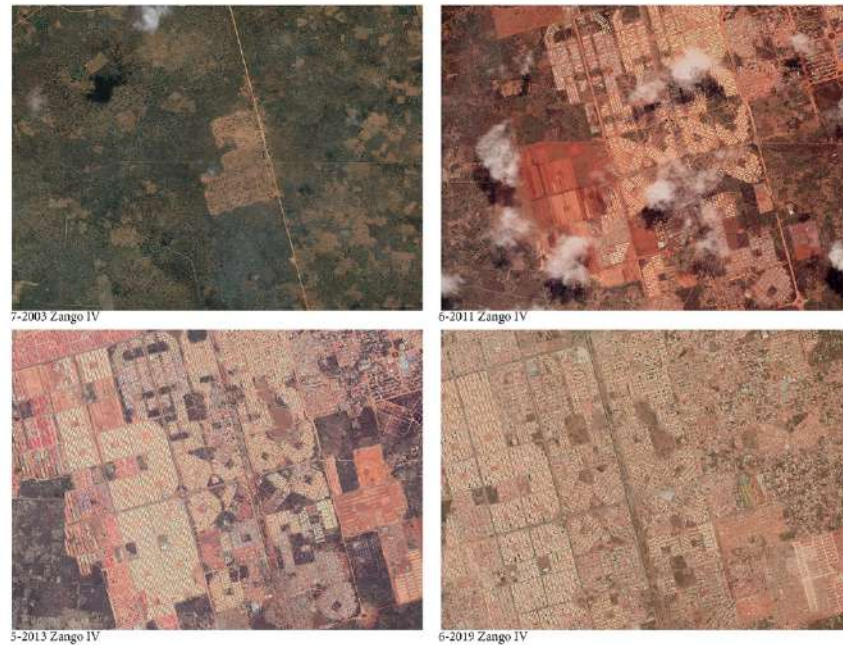


FIGURE 54 SATELLITE MAP SHOWING THE GROWTH OF ZANGO IV

Located on the south-eastern outskirts of Luanda, Zango was one of the first social housing projects to be built after the end of the Angolan Civil War. Built out in phases by a variety of foreign corporations, Zango has been the subject of both praise and criticism.⁶² The project was widely censured by domestic and international observers in 2001 as being tantamount to apartheid practices.⁶³ Despite the backlash, Zango is one of the fastest growing areas in the city and has become a desirable option for many residents. Notwithstanding a minimal level of basic services, the location offers residents the opportunity to own a home in a planned neighborhood.⁶⁴ The popularity of Zango has given rise to a substantial

⁶² Sylvia Croese, "New African Urbanisms: A View from Luanda - UrbanAfrica.Net," Urban Africa, accessed April 3, 2020, <https://webcache.googleusercontent.com/search?q=cache:QR0kFvaR3y0J:https://www.urbanafrika.net/news/new-african-urbanisms-view-luanda/+&cd=1&hl=en&ct=clnk&gl=ca>.

⁶³ Ibid.

⁶⁴ Ibid.

informal real estate market, with houses being sold onward by their owners, despite rules against selling, renting out, or using homes for other than residential purposes. Houses sold (illegally) fetch a high value on the market: up to \$50,000 USD with rents starting at about \$100 USD a month.⁶⁵



FIGURE 55 HOUSE BEING CONSTRUCTED IN THE ZANGO III NEIGHBORHOOD

⁶⁵ Gastrow, "Zango: Plans Unravel - UrbanAfrica.Net."



FIGURE 56 MAIN ROAD IN ZANGO III NEIGHBORHOOD

Zango has become something more than a rehousing project. The grid-like layout of housing coupled with informal activity create a mix of uniformity and customization. While houses tend to be of the same basic model -- three bedrooms, a kitchen, a lounge, and a bathroom -- many have undergone unauthorized modifications and additions, some to such a degree that they hardly resemble their original state. Residents have also set up businesses, services, and shops in their homes, turning them into private schools, day cares, stores, beauty parlors, pharmacies and restaurants.⁶⁶ Such acts are strongly condemned by the state, which issues fines for modifying the shape and color of houses.⁶⁷

The following describes the situation from the perspective of a resident:

The state “has lost control of the project”[2], says one resident. This massive investment will not end the growth of informal housing areas, and, without

⁶⁶ Ibid.

⁶⁷ Ibid.

*coercion, will not stop people from simply moving away from the area. Therefore, as a solution to the supposed problem of urban informality, it seems questionable. What it is becoming is an experiment in African urbanism, and more time will need to pass for the project to be fully understood.*⁶⁸

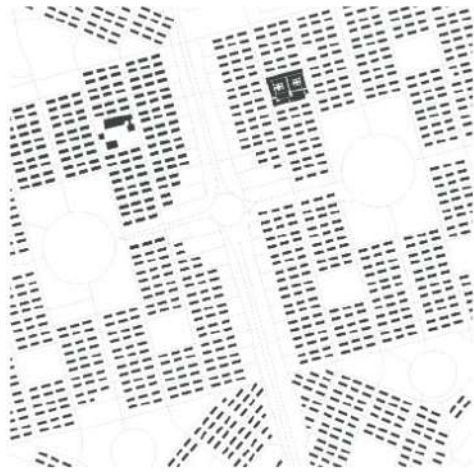


FIGURE 57 FIGURE GROUND OF A
NEIGHBORHOOD IN ZANGO IV

⁶⁸ Ibid.

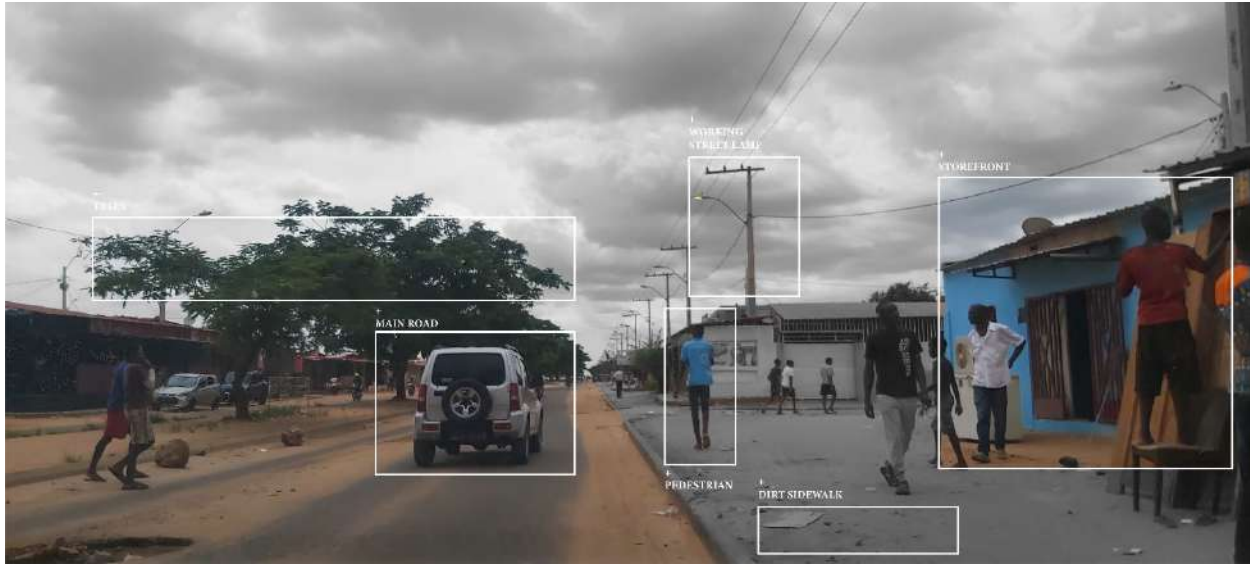


FIGURE 58 IMAGE ANALYSIS OF A MAIN STREET IN ZANGO



FIGURE 59 IMAGE ANALYSIS OF AN INFORMAL SETTLEMENT IN ZANGO

PANGUILA



FIGURE 60 AERIAL MAPS SHOWING THE DEVELOPMENT PHASES OF PANGUILA

Panguila, located some 30 km north of central Luanda, was established in 2003 under the 2002 National Reconstruction Program as a relocation site for informal settlers displaced by infrastructure projects in or near the core. Most residents were evacuated from high-risk areas in the municipalities of Cazenga, Cacuaco, Maianga, Rocha Pinto, Kinanga neighborhoods and, mainly, the *Marginal de Luanda* (the coastal boardwalk downtown).⁶⁹ In its earliest stages, Panguila was linked to Luanda by only one road, which had been poorly maintained since the beginning of the civil war in 1975. This made living in Panguila very isolating. Commutes to the city center could take up to two hours.⁷⁰ At that time, Panguila consisted of only 1000 houses

⁶⁹ Jose Bule, "Panguila Experiences Serious Problems | Society | Jornal de Angola - Online," *Jornal de Angola*, accessed April 3, 2020, http://jornaldeangola.sapo.ao/sociedade/panguila_vive_serios_problemas.

⁷⁰ Chloé Buire, "The Dream and the Ordinary: An Ethnographic Investigation of Suburbanisation in Luanda," *African Studies* 73 (2014): 296, <https://doi.org/10.1080/00020184.2014.925229>.

built by a Chinese developer, organized in rows along sand streets. Over time, however, the government extended Panguila on an ad-hoc basis into other neighborhoods, many of which were also built by foreign contractors.⁷¹



FIGURE 61 IMAGE OF A NEIGHBORHOOD IN PANGUILA⁷²

Nowadays, residents distinguish between different portions of Panguila as sectors ('Sector 1', 'Sector 2', 'Sector 3' etc.), which follow the chronology of the area's build-out. Sectors are also identified by the nationality of the contractor, which correspond to the color of various features (e.g., the 'red roofs' refer to a zone of prefabricated units built by an Israeli company). As of 2019, Panguila had evolved into a community of some 60,000 inhabitants divided among eleven different sectors.⁷³

⁷¹ Ibid, 296.

⁷² Bule, "Panguila Experiences Serious Problems | Society | Jornal de Angola - Online."

⁷³ Buire, "The Dream and the Ordinary: An Ethnographic Investigation of Suburbanisation in Luanda." 297.



FIGURE 62 STREET IN PANGUILA'S SECTOR 1, CLOSEST TO THE MAIN HIGHWAY

Despite its rough beginnings, perceptions of Panguila shifted as additional investment was made in the area. Residents described growth as ‘the city coming to Panguila’ (*a cidade está a chegar*).⁷⁴ Over time residents who were once forced to commute by moto-taxi to reach amenities or restricted to buying goods from street vendors, had access to new stores and small businesses. Although the initial streets and houses were not highly valued, the gridded organization of the neighborhoods promoted an orderly use of land and helped clarify property rights, which residents protected for future development.

What was once considered a settlement for outcasts is now considered by locals to be a “suburb,” where long-term future growth, homeownership, and independence are possible outside of the crowded metropolis.⁷⁵ This unforeseen trajectory is not a by-product of good top-down planning: many streets remain unpaved and are

⁷⁴ Ibid,297.

⁷⁵ Chloé Buire, “Views of Suburban Luanda: The Move from an Informal Settlement to Social Housing,”

eroding, access to electricity and water are unpredictable, and waste collection is a growing problem. Still, what characterizes Panguila is a community mindset of patient entrepreneurial investment and incremental growth. In the suburb, homes can be remodeled, reapportioned and rebuilt by owners on land to which they possess title.⁷⁶



FIGURE 63 HOUSING IN PANGUILA

⁷⁶ Chloé Buire, “The Dream and the Ordinary: An Ethnographic Investigation of Suburbanisation in Luanda, 298.

In Panguila informal and formal development coexist in harmony. Over the years the self-built nature of *musseques* has merged with basic urban infrastructure and government-sponsored housing projects. The success of Panguila is due to a combination of top-down grid planning and bottom-up incremental improvements undertaken by residents.



FIGURE 64 FIGURE GROUND OF A NEIGHBORHOOD IN PANGUILA

4.5 THE SITE

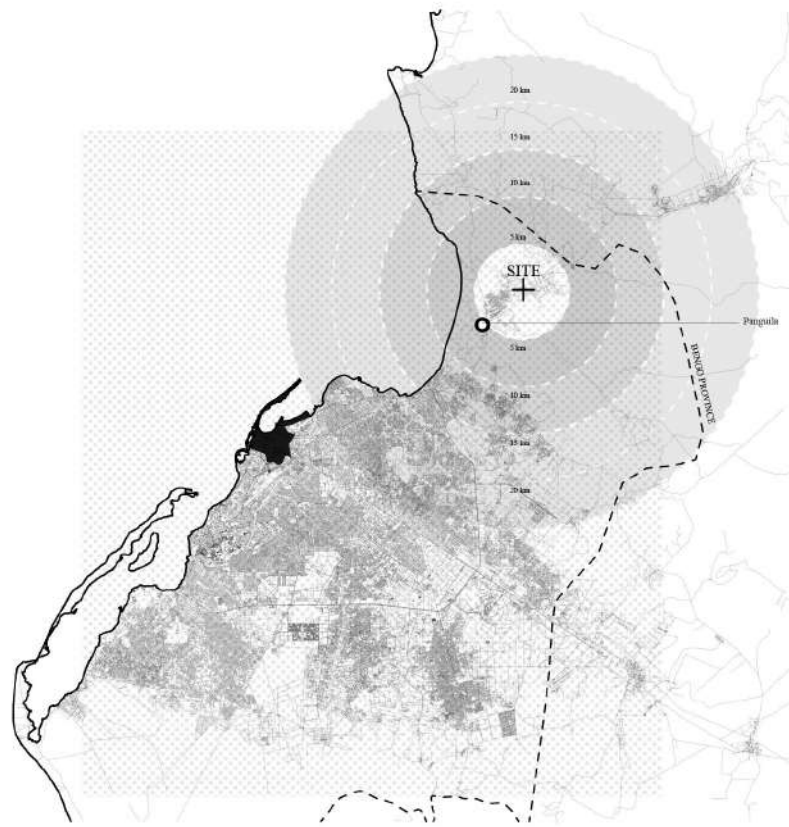


FIGURE 65 LOCATION OF THE SITE

The DW's site in Panguila is about a 30-minute drive from their office in Luanda and about 4km north of the sectors in Panguila described above. In transit to the site from Luanda the low-rise sprawl lining the roadway gradually disappears into rural landscapes. Massive potholes in the road cause bottlenecks, which attract street vendors and collections of taxis.



FIGURE 66 PEDESTRIAN BRIDGE ABOVE HIGHWAY

The DW's site in Panguila is surrounded by walls and marked with a sign to indicate ownership. The properties to the immediate north and south are also walled, and host structures used for the storage of trucks and farming equipment. A vacant property across the main road has also been marked off. Watchmen live on these sites to prevent unlawful occupation.



FIGURE 67 IMAGE OF THE DW SITE, LOOKING NORTH



FIGURE 68 IMAGE OF THE DW SITE, LOOKING WEST

On site I observed a discrepancy between the property boundaries and those indicated on the drawings and surveys that DW had provided us with. While these documents show a trapezoidal property of approximately 21,544 m², the walls onsite enclose a parallelogram with an area of 18,236 m² (a decrease of 3,308 m²). Behind the western wall is a dirt road and another walled property.

After becoming aware of this discrepancy, I attempted to modify the initial site plans I generated for the project. As I had difficulty meeting DW's targets for the site, however, I decided to proceed with the design on the basis of the official documents (see fig. 69)

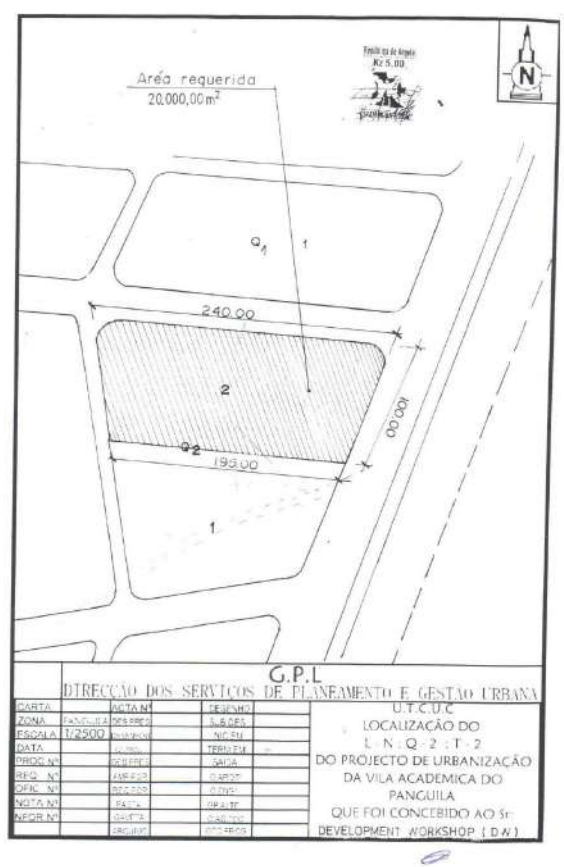
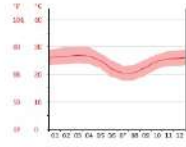


FIGURE 69 OFFICIAL SITE SURVEY AS PROVIDED BY DW

PANGUILA (LUANDA, ANGOLA)

Timezone UTC +1:00 (Africa/Luanda)
Summer time UTC-0:00
Winter time UTC +1:00

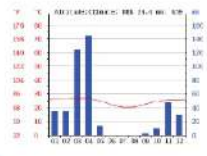
Elevation and coordinates:
Latitude (lat): 8°43'56"S
Longitude (lon): 13°25'18"E
Elevation (approx.): 2m



SITE LOCATION

Elevation and coordinates:
Latitude (lat): 8°67'94.18"S
Longitude (lon): 13°47'257"E
Elevation (approx.): 18.5m Difference

Site Area 21,544 sq. meters
Built footprint 5,160 sq. Meters
20% of Area for market oriented development
(that could cross finance the project)



SITE AREA 21,544 sq. m

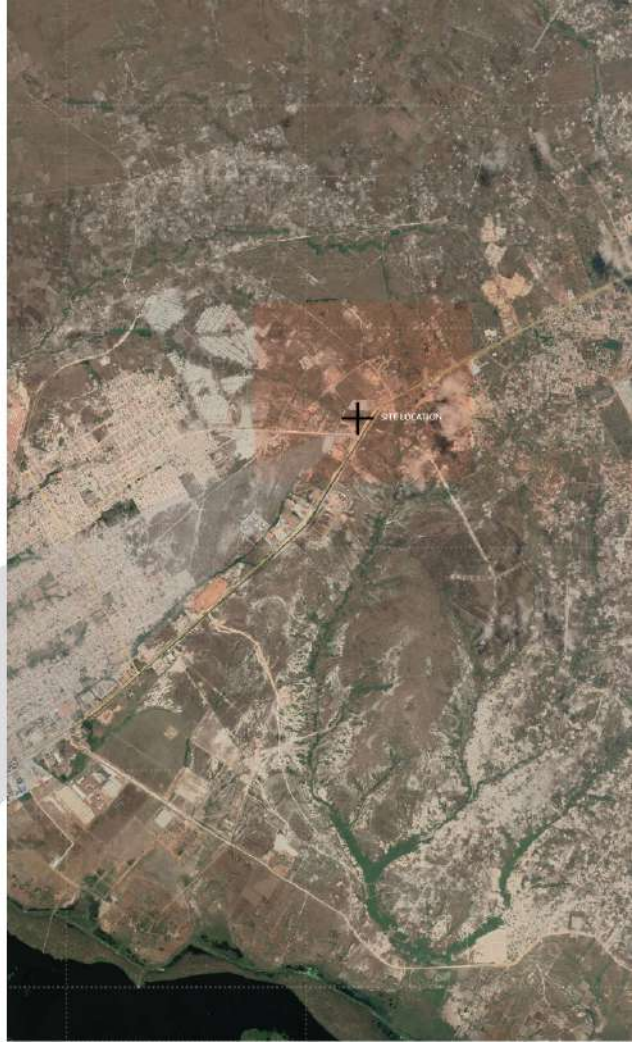


FIGURE 70 SITE LOCATION MAP OF PANGUILA



FIGURE 71 IMAGE ANALYSIS OF THE PANGUILA SITE SHOWING KEY ELEMENTS

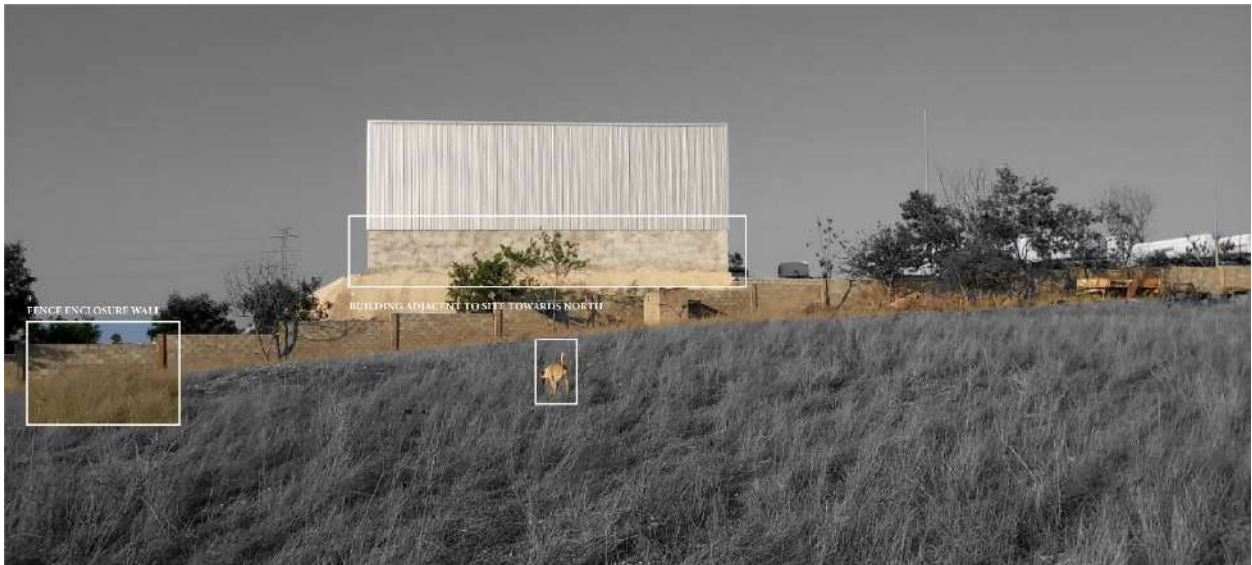


FIGURE 72 IMAGE ANALYSIS OF THE PANGUILA SITE SHOWING KEY ELEMENTS

THE VISION FOR THE SITE

The Development Workshop acquired the 21,544 sq. m (2.15 ha) site in Panguila several years ago. Density targets for the development were based primarily on financial considerations. As there were no direct precedents in Angola for this kind of development, Habiterra based the overall terms of reference on similar projects in South Africa, namely the Brickfield and Alexandra projects in Johannesburg (see 4.6 Affordable Housing). The idea of building a community was paramount; the success of the project depended on target residents buying into it both financially and ideologically. It was understood as a group undertaking to create something of a much higher quality than individual residents could achieve on their own.

According to a brief description of design goals of the project shared by Habiterra:

“This project aims to build a social residential area, where architecture promotes quality and worthy conditions for its residents. Despite the low-cost response of the project, we will not let the absence of certain elements jeopardize the quality of the interior spaces of homes, as well as outdoor areas. The architectural project highlights the importance of quality designed spaces for everyday life of future residents. It aims to deliver dignity and quality life to those who have few resources but whose dream of having a decent home is made true.

Construction methods and materials are taken into consideration with the intention of creating an architectural element with high aesthetic standard leading to an attractive and distinctive image without, compromising its economic sustainability.

The architectural design focuses on good sunlight and natural ventilation principals aiming for sustainable solutions that lead to comfortable climatic conditions for its residents. It also focuses on upgradeable low-cost housing with compressed soil-cement blocks.”

The current plan is to build out the site at a relatively high density, namely 325 units for a target density of about 151 units per hectare (UPH) or 61 units per acre (UPA). Despite the ambitious density targets (residential densities in Luanda average about 11 UPA), buildings will be kept to 4 to 5 stories to obviate the need for elevators. Long-term maintenance and the unreliability of electricity make taller buildings less affordable for a low to middle-income market. To help offset the cost of the undertaking, Habiterra is also considering reserving a portion of the site for future market-oriented housing and commercial development.

The Development Workshop suggested dividing the units as follows: 125 two-bedroom units (type T2) at 50 sq. m and 200 three-bedroom units (type T3) at 60 sq. m – all of which were to be cross ventilated. Parking requirements are high – one space per unit – given the degree to which Luandans depend on private vehicles in the absence of reliable public transit. Other programmatic requirements include outdoor spaces for leisure and active recreation (e.g., at least one 5-a-side soccer pitch) to encourage social interaction and foster community cohesion. Portions of the ground floors of buildings are to be set aside for retail uses, small offices for co-working, game rooms, storage for sports equipment, etc. Provision must also be made for a branch office for the micro-finance institution that will offer housing loans. In addition, it was recommended that space be set aside for a community center that might include a day-care and a health clinic, among other uses.

Water management is a key consideration as there are no municipal services available. As such, it will be necessary to explore strategies for the provision and storage of drinking water, the retention and release of stormwater, and sewage management. Projects of this type often include underground storage tanks for

potable water (10m.cu. per unit) with pumps connected to each unit. While households typically purchase water from a water truck, larger tanks may serve multiple units. Similarly, septic tanks and rainwater cisterns must be incorporated into the design. Provisions may also be made for the generation of electricity, namely solar arrays and back-up generators.

Habiterra provided us with a draft design document they prepared for the municipality in order to secure preliminary approval for the project. The document included a 3D visualization of the site (Fig.73), sample unit layouts, and overall

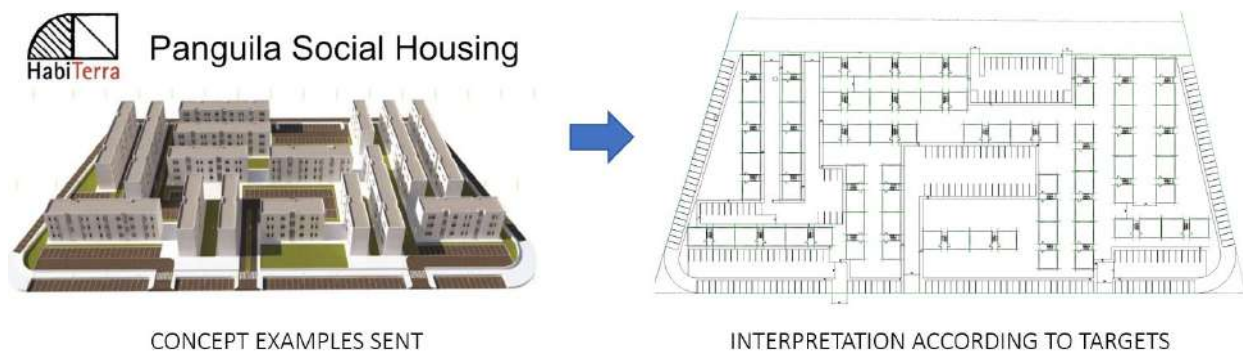


FIGURE 73 EARLY DESIGN CONCEPT FOR THE SITE BY HABITERRA

targets for unit numbers, sizes, and parking spaces. Although done in order to test the terms of reference for the site, the concept model was maze-like in its configuration and a bit difficult to interpret. Buildings were shown as 3-stories rather than four and there were several other inconsistencies with unit numbers, sizes, and parking spaces. Also, while the sample layout showed the site as flat, it is steeply sloped – with about an 18.5-meter difference between the highest and lowest points.

OBSERVATIONS AND FIELD WORK IN PANGUILA



FIGURE 74 IMAGE OF A STREET IN PANGUILA

I was fortunate to be guided through several of Panguila's sectors by one of the community leaders, Isolde Sangama. Throughout my visit, I conducted interviews with the aid of a guide and Jussarra Barreto, an employee from DW who helped me translate questions.

As noted above, Panguila has more than eight thousand residences, divided among 11 sectors.⁷⁷ The sectors in Panguila benefit from varying levels of infrastructure and consist of relatively uniform single-story houses arranged in rows. The area faces serious problems with basic sanitation and drinking water although Sector 1 has the most reliable services. The first neighborhood I visited was off the highway and had paved streets, uniquely painted houses, fenced properties, and discernable stores. Interior spaces were subdivided by thin partitions. Moto-taxis in this area carried residents in and out of town.

⁷⁷ Bule, "Panguila Experiences Serious Problems | Society | Jornal de Angola - Online."

The neighborhoods further from the main highway had significantly less infrastructure and were connected by a network of dirt roads. Large piles of garbage along these roads suggested that trash collection is an issue. Soil erosion and vegetation prevented cars from circulating, forcing residents to move about by foot or motorcycle. Children could be seen scavenging garbage along these roads, looking for things to sell.

In the next sector I visited, the sand roads were even more deeply eroded, exposing the buried electrical lines. Taxis did not circulate inside these neighborhoods because the streets were in such poor shape. Houses had blue tanks outside their homes to conserve water (see fig.75).



FIGURE 75 NEIGHBORHOOD IN PANGUILA



FIGURE 76 2 STORY UNIT MODIFICATION IN PANGUILA



FIGURE 77 ERODED DIRT ROAD IN A PANGUILA NEIGHBORHOOD

A short road by a church was the only pavement I saw outside of Sector 1. My guide explained that it had been done for demonstration purposes. Despite the condition of roads, “main streets” were easily identifiable in this sector as they were lined with non-functioning streetlamps and crumbling sidewalks (see fig.77). Concrete walls enclosed some of the properties and a few residents had added a second floor to

their dwellings. My guide explained that there are rules regarding what modifications and additions could be done to houses and how far one could build into the street. Permission for changes is granted by the state.

A primary school in this area doubled as a community centre. I was able to conduct an interview with the school's director who explained that they were severely underfunded (see in Appendix I). They would need nine additional classrooms to accommodate the population of children and they did not have many teachers. As a solution, the school launched a program where resident fathers teach classes. In addition, community money was pooled to purchase basic services for the school (such as water), although not everybody has the means to pay.

Houses in the newer sectors further from the main highway are organized into rows but have no streetlamps to imply a suggestion of roads. Some of the houses in this sector had no doors, windows, water, or electricity. I conducted interviews with several individuals who rented rooms in these houses and a group of young adults who built a preschool from zinc plated sheets to serve local children.



FIGURE 78 NEWER SECTOR FURTHER FROM THE MAIN HIGHWAY IN PANGUILA



FIGURE 79 OPEN FIELD. NEWER SECTOR FURTHER FROM THE MAIN HIGHWAY IN PANGUILA



FIGURE 80 PERIPHERAL MUSSEQUE IN PANGUILA

I was also escorted through some of the *musseques* that are developing around the periphery of Panguila. Sprawling far from the main highway, these rural settlements are much less dense than the musseques closer to central Luanda (see fig.79). The self-built structures were often quite small and constructed from concrete blocks and corrugated metal. It was unlikely that these structures had water or electricity.



FIGURE 81 IMAGE ANALYSIS OF A NEIGHBORHOOD IN PANGUILA SHOWING KEY ELEMENTS



FIGURE 82 IMAGE ANALYSIS OF A NEIGHBORHOOD IN PANGUILA, SHOWING KEY ELEMENTS

4.6 AFFORDABLE HOUSING

DW and Habiterra also asked us to look at two precedents for affordable, multi-unit housing in South Africa that were aligned with their vision for the Panguila site. Both projects are comprised primarily of four-floor, walk-up, multi-unit buildings divided into compact two and three-bedroom flats.

BRICKFIELD, JOHANNESBURG



FIGURE 83 AERIAL VIEW OF BRICKFIELD⁷⁸

The Brickfield project, located in Johannesburg, South Africa, employs a perimeter-block site plan which includes 9-story towers and 4-story walk-ups. A double ring of buildings surrounds a central courtyard that is used for parking. Buildings are entered through the smaller courtyards separating the outer and inner rings, which

⁷⁸ AERIAL VIEW OF BRICKFIELD. SAVAGE DODD ARCHITECTS . ACCESSED APRIL 3, 2020. [HTTP://SAVAGEDODD.CO.ZA/PORTFOLIO/BRICKFIELDS/](http://savagedodd.co.za/portfolio/brickfields/).

are also used for drying laundry. As a mixed-used development, the Brickfield complex incorporates retail spaces, live-work units and community facilities including a crèche, a community recreation room, and playground areas. Residential units consist primarily of 2-bedroom flats ranging in size from 45 to 50 m². The Development Workshop based unit sizes and building heights for the Panguila site on the Brickfield project.



FIGURE 84 FIGURE GROUND OF BRICKFIELD

ALEXANDRA, JOHANNESBURG



FIGURE 85 IMAGE OF A NEIGHBORHOOD IN THE ALEXANDRA RENEWAL PROJECT⁷⁹

The Alexandra Renewal Project, also located in Johannesburg was constructed in 2001 to address affordable housing shortages and upgrade living conditions. It was a combination of in situ slum renewal and new construction on an adjacent greenfield site. The overall project includes a mixture of flats in multi-story buildings and freehold units at 2 to 4 stories with new road infrastructure. The units, organized as flats in 4-story walk-ups, are arranged in cul-de-sacs within an overall street grid.

⁷⁹ *Image Of A Neighborhood In The Alexandra Renewal Project. Slide Serve. Accessed April 3, 2020.*
<https://www.slideserve.com/licia/alexandra-renewal-project-presentation>.

The Alexandra Renewal Project incorporates a network of societal amenities and community centres. The Alexan Resource Centre serves multiple functions: a high school (with stadium), library, computer lab, youth advisory centre, medical office and pension pay point. In addition, the center provides municipal services for heritage and the Alex Chambers of Commerce.⁸⁰ This precedent provided an example for large scale affordable housing development, greenfield development and societal facilities for community building.

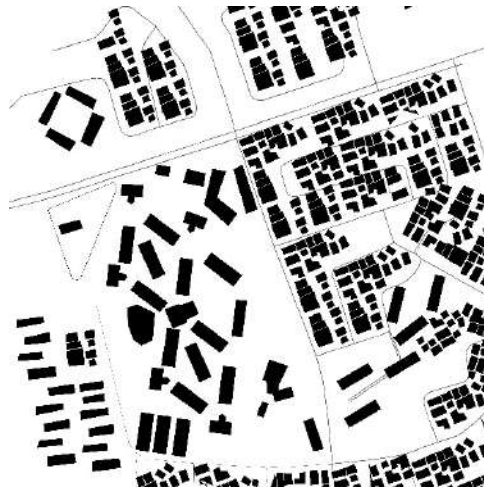


FIGURE 86 FIGURE GROUND OF ALEXANDRA

⁸⁰ G Haas, "Community Art Training Centre," 2007, 4, <https://webcache.googleusercontent.com/search?q=cache:1jAA0ZdR7uMJ:https://repository.up.ac.za/bitstream/handle/2263/24787/Complete.pdf%3Fsequence%3D8+&cd=1&hl=en&ct=clnk&gl=ca>.

4.7 KEY TAKEAWAYS FROM THE ANALYSIS OF PRECEDENTS

By examining the various settlements and affordable housing types described above, I set out to identify which features/considerations were most relevant to the design for the site in Panguila. Where housing in Luanda is concerned, I analyzed the histories, successes and shortcomings of 1) government-sponsored, multi-unit housing for the middle and upper-middle classes (e.g., Nova Vida and Talatona), 2) new centralities (e.g., Kilamba and Capari), 3) relocation areas such as Zango and Panguila and, 4) *musseques*. Although my project is different from all of these, it falls somewhere in the middle as a smaller project aimed towards the lower-middle class. Below are key takeaways from the precedents researched.

CONDOMINIUMS AND CLEARANCE PROJECTS— TALATONA & NOVA VIDA

Advantages

- Assigned parking, maintained roads, lawns and landscaping in Talatona and Nova Vida
- Talatona and upper-class developments – nice design – shows taste
- While private markets service the rich, upscale developments often generate employment opportunities for unskilled workers, indirectly benefitting those in nearby, lower-status neighborhoods.
- Can include multi-unit dwellings which enable the neighborhoods to be built out at much higher densities than the neighborhoods they replace. Especially close to the core, higher densities are significantly more sustainable.
- Formalizing land tenure can be good for the municipality inasmuch as it enables the municipality to collect taxes.

- Bring the nature of development of land in line with land values. The area's most ripe for redevelopment are frequently closest to the core and/or to transit stops.

Disadvantages

- Large-scale projects can be controversial with respect to land acquisition.
- Relocating residents to make way for new developments can be complicated and controversial – especially when existing residents are relocated to less favorable locations.
- Require a significant amount of upfront capital and government cooperation.

Conclusion

- Although unaffordable to the majority, the condominiums are a precedent with respect to the quality housing that Angolans are seeking. They also represent a desire for security and comfort. The aesthetic and quality features should be considered for the design proposal.

MUSSEQUES – URBAN, PERIPHERY

- Fall into multiple categories: established and new; central and peripheral, those built out on a formal layout of streets (with informality limited to the development of individual properties) and those built out with no discernible street patterns and ambiguous thresholds between public and private spaces.

Advantages

- Homes are modified to accommodate more people as populations grow.
- Homes (including adjacent outdoor spaces) can be used to support a variety of activities, including informal economic activity.

Disadvantages

- Given ad-hoc construction techniques, however, the ability of structures to be modified is limited. The inability to build higher than two stories limits the overall density of the musseques.
- Despite the living conditions and overall poverty, there are small populations in the musseques that have the means to upgrade their housing. Motivation to do so, however, is limited inasmuch as residents do not possess clear title to the properties they occupy.
- Migration of the poor from the city center to relatively cheaper peripheral territory is a rapidly increasing phenomenon.
- Unplanned peri-urban settlements are difficult to manage and to upgrade.

Conclusion

- Although unsustainable, underserved and difficult to manage, the musseques naturally support a range of economic activity and a strong social coexistence outside the home. The salient courtyards and alleys generate important neighborly relationships. These social and socio-spatial elements that emerge in the musseque should be considered for the design proposal.

CENTRALITIES – NOVA CIDADE DE KILAMBA, CIDADE DE CAPARI

Advantages

- Angolans want to own a house and in so doing, be able to benefit from the increase in land values in cities like Luanda. Rent-to-purchase schemes are an attractive proposition for home ownership and for Luandans seeking to leave the musseques.
- Due to the nature of the formal design, the centralities incorporate the organization of space, infrastructure, and dwellings that make residents feel secure.
- Residents make use of the wide sidewalks by using them for commerce and open fields for children to play.
- There are working traffic lights, maintained lawns, and schools nearby. Interior spaces at grade are also used by the residents to run small businesses.
- Centralities and other new formal housing developments frequently spawn formal and informal developments on adjacent lands. These developments attract residents seeking employment opportunities and shorter commutes.

Disadvantages

- The rapid implementation of large-scale centrality projects has resulted in many unoccupied apartments due to unaffordability and inaccessibility.
- Unoccupied centrality projects can cause unrest and violent reactions if unaffordable and inaccessible to neighboring populations.

- Residents of centralities on the far periphery can experience difficulties getting to work and accessing basic services without a car. Most are dependent on the availability of taxis and traffic can be severe.

Conclusion

- Living in centralities is a source of pride for its residents as they are planned, secure and often well maintained however, the recession and rising unemployment rates led to a significant percentage of those living in the centrality not being able to meet their monthly mortgage commitments. Buildouts must be strategically phased so that buildings are not left empty and budgets are not exhausted. Nonetheless the quality infrastructure, facilities, and amenities should be considered in the design proposal.

RELOCATION SITES – ZANGO, PANGUILA

Advantages

- The grid organization of the neighborhoods has had a positive long-term effect on land use, order and property rights. Planned street grids are necessary organizing principles for land tenure and future urban development
- Residents have set up businesses, services, and shops in their homes
- The prospects of acquiring a house to own in a planned neighborhood has led to increased demand for affordable housing.

Disadvantages

- Though Informal real estate markets exist, buyers lack formal title to the properties they “purchase” from the legitimate owners.

- Many houses have undergone unauthorized modifications and additions to such a degree that they hardly resemble their original state. This activity is condemned by government authorities.

Conclusion

- Formal development must accommodate Informal activity. Residents often set up shops, restaurants, and services in their dwellings. Control mechanisms must be put in place, however, to control who does what and where. Ideally these mechanisms are community based (i.e., monitored by a community or homeowners association).

Outside of Luanda I looked at multi-unit projects geared to modest-income households in South Africa as a precedent for affordable housing. By acknowledging key features in their planning, amenities and density, I aimed to synthesize strategies for affordable multi-unit housing.

AFFORDABLE HOUSING – BRICKFIELD, ALEXANDRA

- As a mixed-used development at a density similar to the target for the DW's site in Panguila, the complexes incorporate retail spaces, live-work units and community facilities including a crèche, a community recreation room, and playground areas.

4.8 PRECEDENT DENSITY STUDY

As a complementary component to the neighborhoods analyzed above, I conducted density studies to compare and contrast UPH and FSI of the precedents with the DW target densities.⁸¹ Sample fabric of the precedent neighborhoods were transposed within the site boundaries to visualize unit density space efficiency.

Site (Design Proposal)
Multi-Unit Housing
Unit Count: 325
UPH: 151
UPA: 61
FSI: 0.91

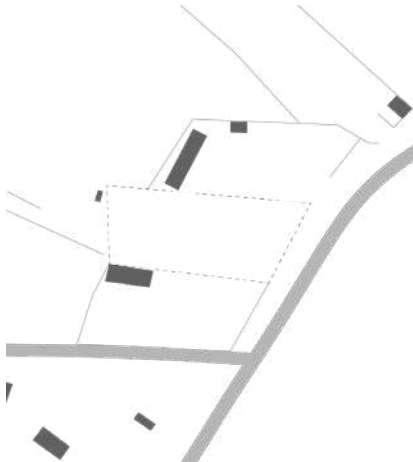


FIGURE 87 SITE

⁸¹Urban density is calculated via two complementary ways:

1. **Floor Space Index (FSI):** gross floor area of built floor space divided by the area of the site.
2. **Units per acre/hectare (UPA/UPH):** total number of residential units divided by the area of the site (measured in acres or hectares). The calculation of unit numbers is done differently depending on the type of residential building.
 - a) Single family detached houses and townhouses: 1 unit each
 - b) Duplexes and semi-detached: 2 units each
 - c) Multi-unit residential buildings (e.g., apartment buildings or condos):
 1. take the gross square area of the building x .8 (or 80% of the gross floor area of the building) to compensate for common areas (corridors, lobbies, vertical circulation). This gives you the net area.
 2. Divide the net area by 70 (if working in sq. meters) or 750 (if working in square feet) – which is the average size of a 1-bedroom apartment. In any given building some units will be larger and others will be smaller. 70 m² is a good average when computing the total number of dwelling units (*note Kilamba units are much bigger and were calculated with a average 130 m² instead of 70 m²)

RELOCATION SITES

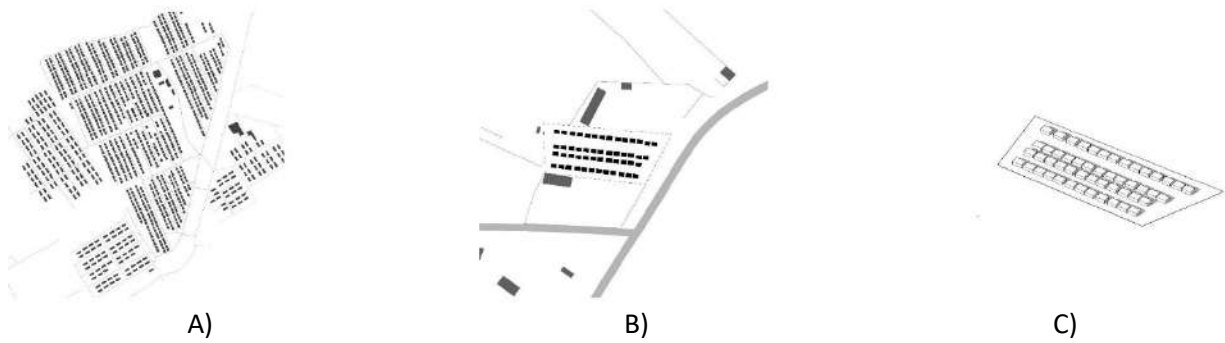


FIGURE 88 A) FABRIC SAMPLE, B) HOUSING DISTRIBUTION ON SITE, C) SITE PERSPECTIVE

Panguila (sectors)

Housing Type: Single Family Detached

Were the same approach to density/buildout applied to my site, I would be able to accommodate:

- 51 units (compared to our target of 325 units)
- At a density of 23.7 UPH (compared to our target density 151 UPH)
- For an FSI: 0.23

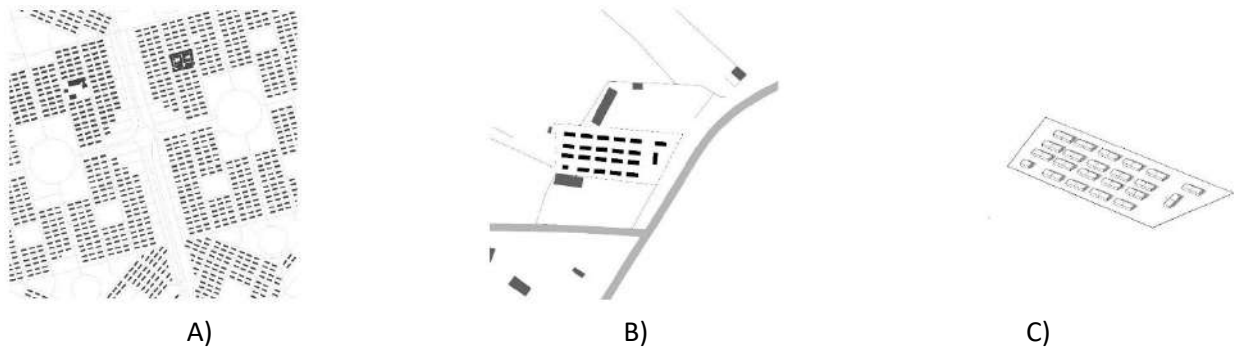


FIGURE 89 A) FABRIC SAMPLE, B) HOUSING DISTRIBUTION ON SITE, C) SITE PERSPECTIVE

Zango IV

Housing Type: Single Unit Housing

Were the same approach to density/buildout applied to my site, I would be able to accommodate:

- 43 units (compared to our target of 325 units)
- At a density of 20 UPH (compared to our target density 151 UPH)
- For an FSI: 0.06

CENTRALITIES

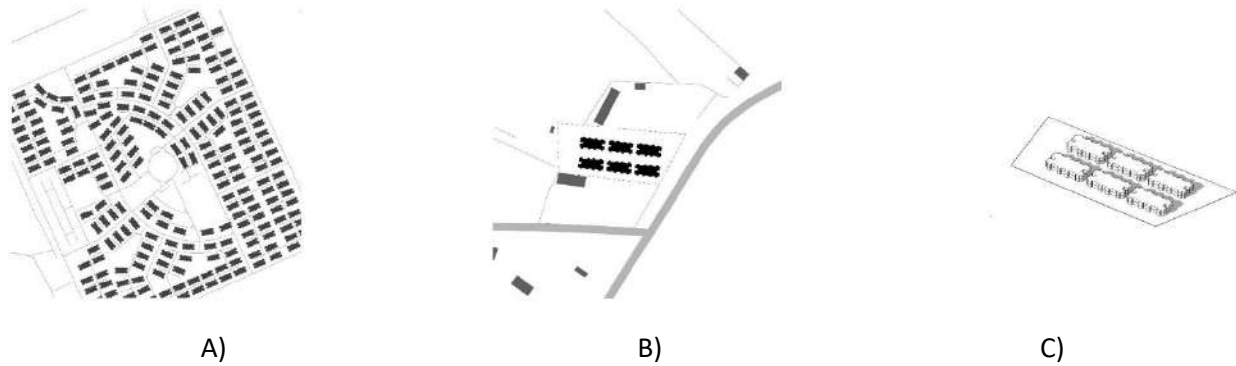


FIGURE 90 A) FABRIC SAMPLE, B) HOUSING DISTRIBUTION ON SITE, C) SITE PERSPECTIVE

Capari

Housing Type: Multi Unit Housing

Were the same approach to density/buildout applied to my site, I would be able to accommodate:

- Approx. 48 units (compared to our target of 325 units)
- At a density of 55.9 UPH based on gross area (compared to our target density 151 UPH)
- For an FSI: 0.49

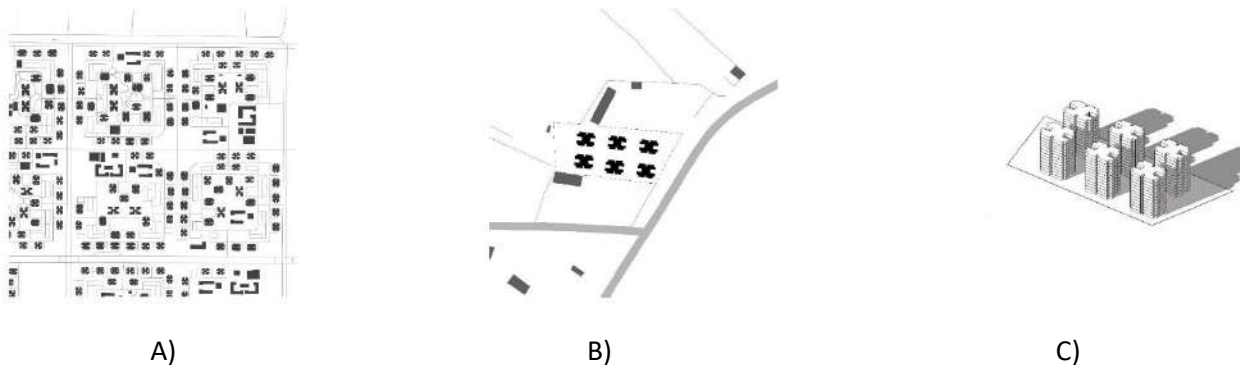


FIGURE 91 A) FABRIC SAMPLE, B) HOUSING DISTRIBUTION ON SITE, C) SITE PERSPECTIVE

Kilamba

Housing Type: Multi Unit Housing

Were the same approach to density/buildout applied to my site, I would be able to accommodate:

- Approx. 312 units (compared to our target of 325 units)
- At a density of 148.5 UPH based on gross area (compared to our target density 151 UPH)
- For an FSI: 2.41

CONDOMINIUMS AND REDEVELOPMENTS

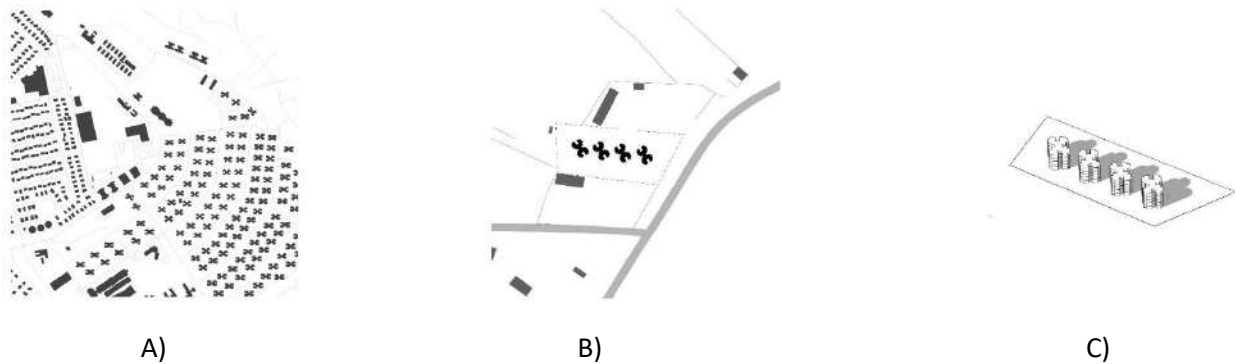


FIGURE 92 A) FABRIC SAMPLE, B) HOUSING DISTRIBUTION ON SITE, C) SITE PERSPECTIVE

Nova Vida

Housing Type: Multi Unit Housing

Were the same approach to density/buildout applied to my site, I would be able to accommodate:

- Approx. 80 Units (20 units per building) (compared to our target of 325 units)
- At a density of 52.7 UPH based on gross area (compared to our target density 151 UPH)
- For an FSI: 0.46

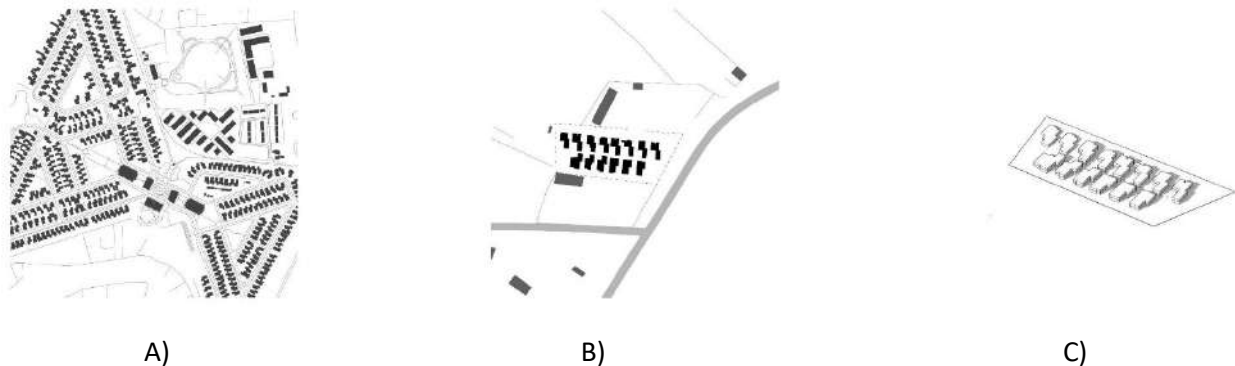


FIGURE 93 A) FABRIC SAMPLE, B) HOUSING DISTRIBUTION ON SITE, C) SITE PERSPECTIVE

Talatona

Housing Type: Single Unit Housing

Were the same approach to density/buildout applied to my site, I would be able to accommodate:

- Approx. 14 units (compared to our target of 325 units)
- At a density of 78.0 UPH based on gross area (compared to our target density 151 UPH)
- For an FSI: 6.08

MUSSEQUES

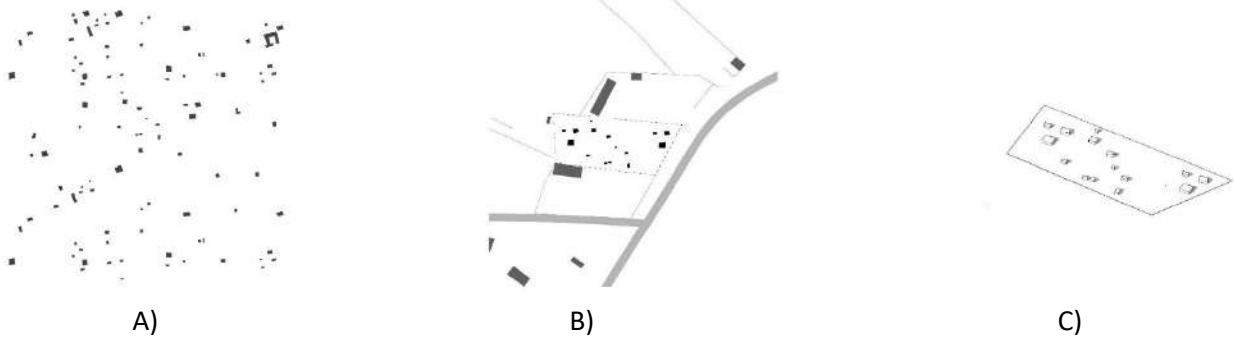


FIGURE 94 A) FABRIC SAMPLE, B) HOUSING DISTRIBUTION ON SITE, C) SITE PERSPECTIVE

Peri-Urban Musseques (North of Panguila)

Housing Type: Single Unit Housing

Were the same approach to density/buildout applied to my site, I would be able to accommodate:

- Approx. 15 units (compared to our target of 325 units)
- At a density of 7 UPH (compared to our target density 151 UPH)
- For an FSI: 0.03

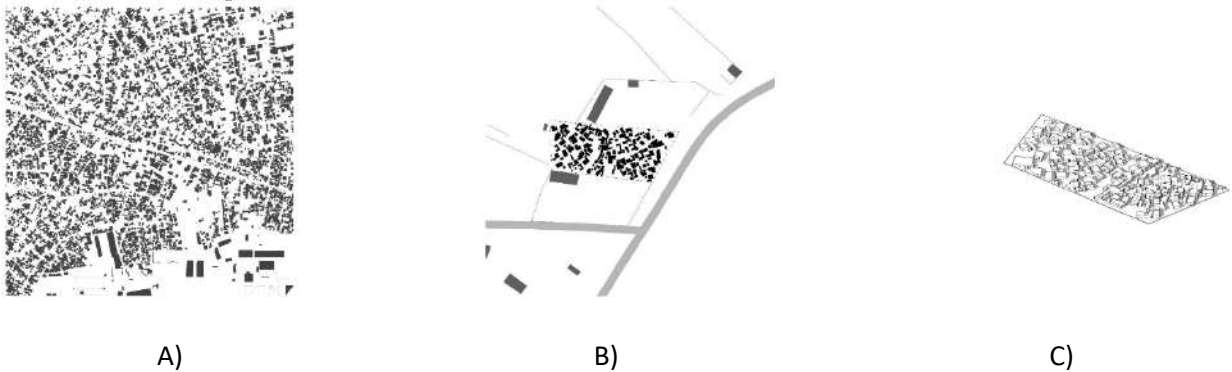


FIGURE 95 A) FABRIC SAMPLE, B) HOUSING DISTRIBUTION ON SITE, C) SITE PERSPECTIVE

Urban Musseques (North of Marconi)

Housing Type: Single Unit Housing

Were the same approach to density/buildout applied to my site, I would be able to accommodate:

- Approx. 79 units (compared to our target of 325 units)
- At a density of 83.1 UPH based on gross area (compared to our target density 151 UPH)
- For an FSI: 0.37

SOUTH AFRICAN AFFORDABLE HOUSING

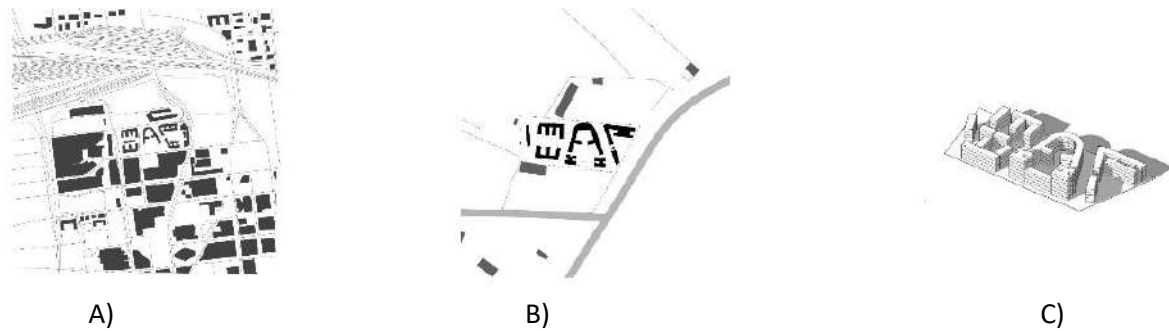


FIGURE 96 A) FABRIC SAMPLE, B) HOUSING DISTRIBUTION ON SITE, C) SITE PERSPECTIVE

Brickfield, Johannesburg

Housing Type: Multi- Unit Housing

- At a density of 158.5 UPH based on gross area (compared to our target density 151 UPH)
- For an FSI: 1.39

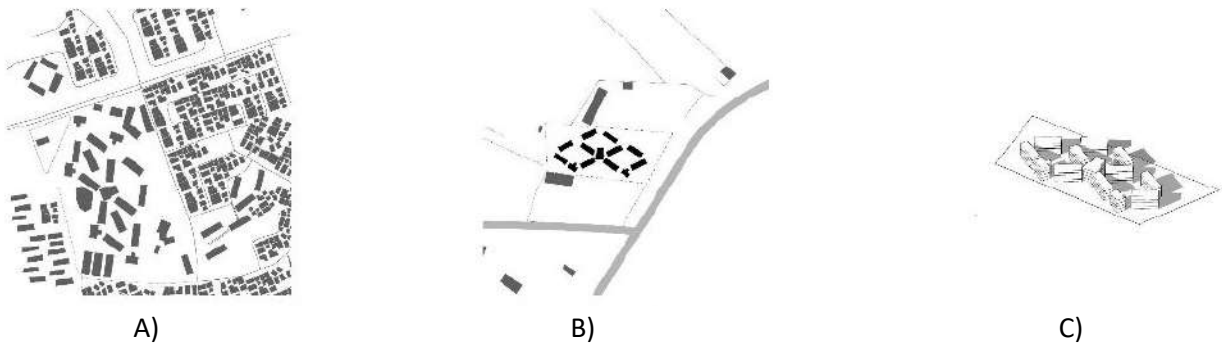


FIGURE 97 A) FABRIC SAMPLE, B) HOUSING DISTRIBUTION ON SITE, C) SITE PERSPECTIVE

Alexandra, Johannesburg

Housing Type: Multi- Unit Housing

- At a density of 84 UPH based on gross area (compared to our target density 151 UPH)
- For an FSI: 0.74

5.0 DESIGN STRATEGY

5.1 OWNERSHIP AND SECURITY OF TENURE



DW's proposed development in Panguila will differ from the existing fabric in Luanda not only in its form but inasmuch as it will offer ownership options that are difficult to find elsewhere. All land was socialized when Dos Santos came into power in 2002, effectively crippling the private housing market except at the highest end. Private ownership and security of tenure not only create more stable communities but enable owners to benefit from increases in land value – a key consideration in lifting residents out of poverty.

As noted in Chapter 3, the lack of title to properties in Luanda has prevented the municipal government from collecting taxes, leaving it without the revenue needed to invest in public infrastructure. Instead, funds for such investments, sporadic as they have been, have come predominately from foreign investors and primarily in the form of loans made at the federal level. In addition, like the private markets, Government -funded housing projects often favor the affluent to reduce risk.

5.2 HIGH DENSITY DEVELOPMENT



If done in a thoughtful way, multi-story, multi-unit housing will make units more affordable, open home ownership to a greater number of people, foster integrated communities, and free up space for amenities, services and public facilities. Higher-density development is an important strategy to combat the low-density informal fabric that accounts for much of Luanda’s housing. Low-density urban development is inefficient, unsustainable and contributes to clogged streets and long commutes.⁸² Higher-density approaches should be applied both to the redevelopment of existing, self-built settlements – Luanda’s extensive musseques – and to new greenfield development on the periphery. Efforts must also be made to prevent low-density musseques from forming around higher-density projects and inform the growth of future development.

⁸² LEED-ND 2009, pg. 75, table 1 – identifies minimums and maximum scores for density in “compact developments”:

- Minimum density necessary to achieve 1 point for “Compact Development” (NDP Credit 2):
 - Residential density greater than 10 and less than or equal to 13 UPA.
 - OR a Non-residential density of between .75 and 1.0 FAR
 - OR a combination of the two
- Density required to achieve Maximum of 6 points:
 - Residential density higher than 63 UPA.
 - OR a Non-residential density higher than 3.0 FAR
 - OR a combination of the two

5.3 INCREMENTAL HOUSING



In its previous development work DW has experimented with “incremental housing,” i.e., housing designed to be added on to over time. Residents purchase a core unit to which they make additions/alterations as they acquire the means to do so. While incremental housing is typically limited to freehold housing -- whether detached or row housing – DW is considering applying some version of the incremental model to the multi-unit housing they have planned for Panguila. This may include the opportunity to enclose terraces and subdivide units. In both cases the ability to adapt units will enable owners to respond to changing household sizes, including subdividing and subletting out portions of their space to generate income. The ability to add incrementally to units also keeps initial construction and purchase costs low. At the lowest end, buyers may be offered an empty shell which they subdivide with partitions over time. Options for alterations and build-out, however, would need to be squared with and managed by the community, with input from the entity that provides financing.

Given this, it made sense to include examples of incremental housing in the precedents I researched.

ELEMENTAL



FIGURE 98 INCREMENTAL HOUSING PRECEDENTS DESIGNED BY ELEMENTAL⁸³

While projects designed by Elemental – an architectural firm based in Chile – are popular case studies for incremental housing, *incrementality has to be dealt with and defined differently with multi-unit, multi-story housing than with freehold.*⁸⁴ If people are going to fill in terraces, there have to be frameworks on how it's done. What one neighbor does affect the look, appeal and salability of another neighbor's unit. Under the condominium designation, one of a several of legal frameworks under which units in multi-unit housing can be individually owned, there are two categories of ownership: what each owner owns fully, i.e., everything within the walls of his/her unit, and so-called common elements. The quality and consistency of the overall complex is key to maintaining the value and salability of

⁸³ Incremental Housing Precedents Designed by Elemental. Future Factory. Accessed April 3, 2020. <https://futurefactory.cc/2018-elemental-social-housing/>

⁸⁴ Conversations with Professor Benjamin Gianni

individual units. To avoid creating a vertical slum, similar to what occurred with the unfinished Torre David in Venezuela, opportunities for incremental changes by individual owners must be carefully managed and monitored. Although not entirely applicable, the housing designed by Elemental is still a strong precedent for the principle of incremental housing as an investment rather than an expense. The provision and arrangement of void spaces to accommodate additions and incremental growth provides a framework for consideration for the Panguila project.



FIGURE 99 TORRE DAVID FAÇADE⁸⁵

⁸⁵ Torre Davide Facade. September 22, 2014. The Guardian.
<https://www.theguardian.com/cities/gallery/2014/sep/22/constructing-worlds-classic-photographs-redefine-cities-in-pictures#img-12>.

HOUSING, YEKA ABADO, ADDIS ABABA

FIGURE 100 INCREMENTAL HOUSING IN ADDIS ABABA⁸⁶

The masterplan for the Yeka Abado project in Addis Ababa, Ethiopia calls for the build out of some 200 hectares of greenfield and includes links to the city center via a Light Rail Transit (LRT) system. The project was created to resettle low income earners on the outskirts of the city and is equipped with a modern market, health centre, schools and other social amenities. Yeka Abado housing consists of 5- to 7-story multi-unit buildings. Units are available for purchase under three subsidized mechanisms:

- 10% down payment, 90% 20-year mortgage at 9% interest for studio and one room units ranging from 25 to 40 m²,
- 20% down payment, 80% mortgage over 15-years for two-bedroom units of 60 m²,

⁸⁶ Yeka Abado Condominium Project. MGM Consult PLC. Accessed April 3, 2020. <http://www.mgmconsultplc.com/projects>.

- 40% down payment, 60% mortgage over a 10-year period for three-bedroom units of 100 m² ⁸⁷

The pilot phase of this project was able to further reduce building costs and increase affordability by offering some low-end units without interior partitions, floor finishes and internal doors. Owners can install or remove lightweight partitions to subdivide or join spaces.⁸⁸ This precedent provided a case study for interior subdivision and increased affordability through reductions in the quantity and quality of the interior fit up.

⁸⁷ "Learning from Integrated Housing Development Program in Addis Ababa | Dw.Angonet.Org," accessed April 27, 2020, <https://www.dw.angonet.org/forumitem/learning-integrated-housing-development-program-addis-ababa>.

⁸⁸ "MICROFINANCE - NAME ADM.NO UNIT COURSE LECTURER OMUCHEYI KELVIN N HD335-C006-7928\2015 HDFI 3115 MICROFINANCE SIMON KABURI 1 BENEFICIAL EFFECTS OF," accessed April 27, 2020, <https://www.coursehero.com/file/14970433/MICROFINANCE/>.

5.4 COMMUNITY DESIGN/COMMUNITY BUILDING



Architecture and urbanism have an important socio-political-economic and environmental role in place-making, identity and cultural expression. The housing for Panguila will also function as a prototype for similar social developments elsewhere in Angola. The project should be realized in such a way as to elevate civic engagement through community-oriented planning. The customs and traditions in Angolan culture are fundamentally communal in nature. Site and building design should create opportunities for societal networking. As discussed in Chapter 4, there is much to be learned from the success and shortcoming of both the top-down projects realized in Luanda over the last several decades as well as the informal settlements that account for the bulk of the city's urban fabric.

In Kilamba, the wide sidewalks are being used as extended porches for restaurants. Musseques, businesses and new neighborhoods have developed around centralities to capitalize on the growth of these cities. In Capari, a lack of diversity in building uses combined with its remote location have inspired residents to create small shops and communal transportation services. Similar activities occur in Zango and Panguila where informal markets are thriving. Common to these housing projects is the phenomenon of Angolans appropriating and adapting their environments to support social interaction and economic activity. As such much of the economy in Angola is informal, it depends on social networks and a blurring of home and work. The

existing social housing built is often built as just that – housing – with little consideration for economic and social activity.

It is important to note that Angolans by very nature are entrepreneurial. To survive in a place like this you need to be savvy. Here in Angola we say your income and your salary are very different things. Even people with 9-5 jobs have a side hustle for extra income.⁸⁹

Although the musseques are disorganized and lack essential services, they naturally accommodate social engagement and are quite adaptable. Like the musseques, the community proposed for Panguila must accommodate a range of activities -- domestic, social and economic -- both formal and informal, public and private. Housing must be designed in such a way as to anticipate changes as residents become more affluent, economic activity formalizes and development occurs on adjacent sites.

The making of this community is itself an exercise in community building (“building” as a noun and “building” as a verb). Residents must want to contribute to a common objective and to see the growth of neighborhoods, schools and services. The community must come together to build the community in which it will live. The ensemble of buildings should be the physical expression of a community that is already coming into being and transforms as the project is realized and the community around it transforms.

⁸⁹ Conversation with David Castello

6.0 HOUSING MICRO FINANCE

6.1 ROTATING SAVINGS AND CREDIT ASSOCIATIONS



Although not typically within the purview of architectural design, I investigated financing options and informal lending groups as it relates to community-based mechanisms for saving and financing. Informal banks and saving systems are common in many parts of the world and operate under different names as a form of capital accumulation. Peer-to-peer lending is formally referred to as Rotating Savings and Credit Associations (ROSCA). This form of savings is called “Pardner” in Jamaica, “Chit Funds” in India, “Hui” In China, “Tanda” in Latin America and “Stokvel” in South Africa. In Angola it is called Kixikila. Despite the different names, the basic structure is the same. ROSCA is based on the ability of communities to come together and help one another. A group of trusted members agree on the amount and schedule of contributions and the rules for dispersing funds. The system is very transparent. Each member contributes the same amount at each meeting, and one member takes the whole sum each cycle. As a result, each member has access to a greater sum of money during the ROSCA's lifetime.⁹⁰ ROSCA gives participants access to funds for supplies (e.g., appliances), encourages accountability in saving, and generates funds for small businesses.⁹¹

⁹⁰ James Chen, “Rotating Credit and Savings Association (ROSCA),” Investopedia, accessed April 5, 2020, <https://www.investopedia.com/terms/r/rotating-credit-and-savings-association.asp>.

⁹¹ Cain, “Housing Microfinance in Post-Conflict Angola. Overcoming Socioeconomic Exclusion through Land Tenure and Access to Credit,” 373.

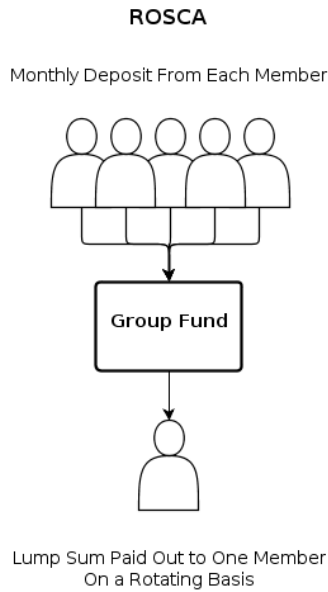


FIGURE 101 DIAGRAM OF ROSCA MICROFINANCE MODEL⁹²

6.2 MICRO FINANCE MODEL

The micro finance model builds on the concept of the ROSCA. The lending strategy provides low risk micro-loans to give low-income recipients the means to build social capital. The model originated from the Grameen Bank Project in Bangladesh during a famine in the 1970s. In Angola, the micro finance model was pioneered by the Development Workshop as a post-war reconstruction strategy to alleviate urban poverty by investing in informal economies.⁹³ DW's microfinance program, called KixiCrédito, adopted and adapted the Grameen Bank's group-lending methods. Systemic trust is created through financial training and successive cycles of small and eventually larger loans granted to groups of 15 to 20 members.⁹⁴ The pilot project, KixiCasa, enables groups of three to five people to access 36-month

⁹² *Diagram Of Rosca Microfinance Model*. Invested Development. Accessed April 3, 2020. <http://investeddevelopment.com/2012/04/the-benefits-of-informal-savings-groups/>.

⁹³ *Ibid*,361.

⁹⁴ *Ibid*,373.

loans from US\$1 000 to US\$6 000. The project also helps fund the incremental growth in housing.

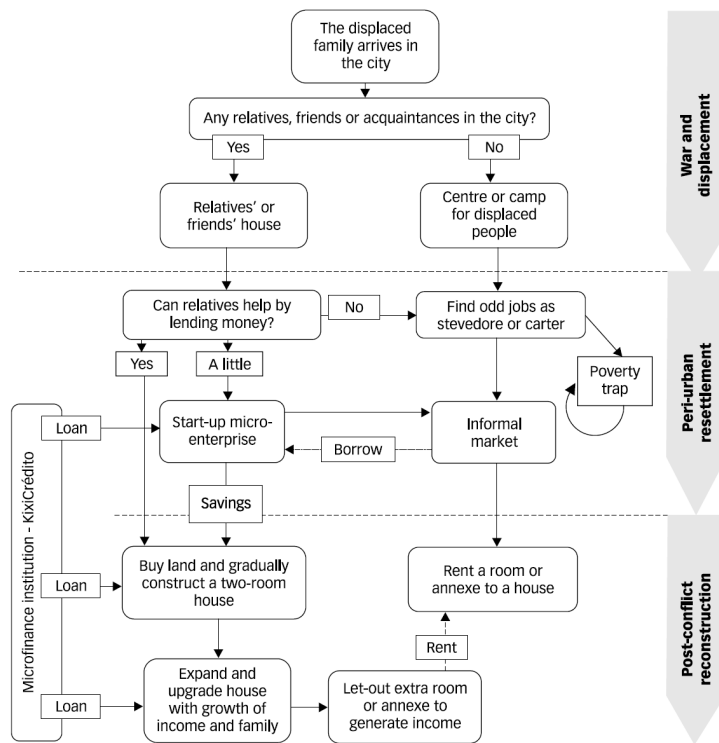


FIGURE 102 URBAN SETTLEMENT OPTIONS SCHEMATIC SOURCE, ADAPTED FROM ROBSON, P AND ROQUE, S (2001), "HERE IN THE CITY", DEVELOPMENT WORKSHOP OCCASIONAL PAPER No 2, LUANDA, PAGE 54.

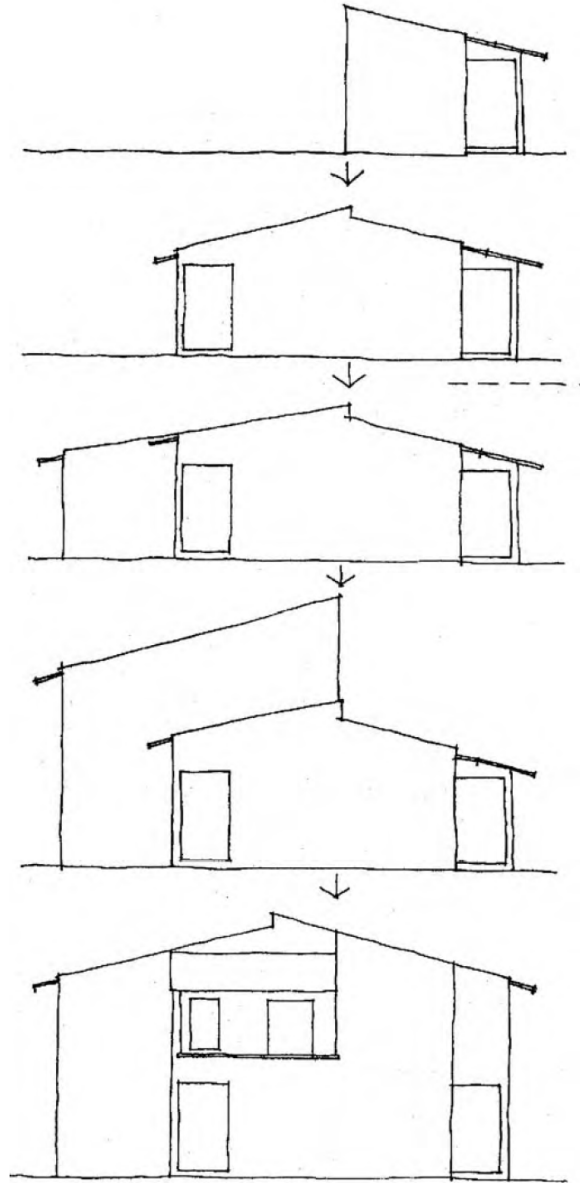


FIGURE 103 UPGRADEABLE HOUSING SUPPORTED BY KIXICASA'S MICRO-SEQUENTIAL LOANS

7.0 DESIGN PROPOSAL

7.1 SITE DESIGN

Larger considerations aside, it was necessary to address the logistical challenges of fitting 325 units on a steeply sloped site while making accommodations for parking, retail, and other economic activities. In addition, DW asked me and my thesis supervisor to consider setting portions of the site aside for a community center and for market-oriented housing and retail. It was also necessary to consider how the site might best be subdivided by streets and how this street pattern might anticipate, connect to, or otherwise coordinate with whatever street pattern might be applied to adjacent properties in the future. As is apparent from (see fig. 73) in section 4, DW's initial site layout did not take many of these issues into consideration.

Decisions on how to introduce streets had an impact on the position of buildings and location of open spaces. Driving the site design was the following considerations, many of which were derived from an analysis of shortcomings of the initial site plan that DW provided:

- The ensemble should not be designed in isolation as a one-off, stand-alone community. Thought should be given to larger urban patterns and connections, anticipating the development of adjacent properties in the near future.
- Trees should be planted throughout the site to provide shade.
- All buildings should face streets and have street addresses.
- Buildings should be organized around courtyards or common spaces.

- Buildings should be no more than 5 stories high to avoid the need for elevators.
- The site should be configured so that it accommodates at least one outdoor, 5-a-side soccer pitch.
- Parking should be distributed throughout the site rather than aggregated into large surface parking lots.
- Provisions should be made for spaces with community-oriented and non-residential uses, including (but not limited to) a community centre, street accessible retail units, and a branch office for the micro-finance company that would offer housing and entrepreneurial loans.
- Where possible, spaces set aside for non-residential uses should be located at grade, ideally facing streets.
- If possible, the change of grade across the site should be leveraged to accommodate non-residential uses at the lower-ground floors of buildings.
- If possible, a portion of the site should be set aside for future market-oriented development, ideally along the eastern edge of the property abutting the main road. As this is the highest point on the site; it is possible that housing in this location could benefit from views to the ocean to the west.

BLOCK CONFIGURATION

With the above in mind, I explored multiple options for site and block configurations. The division of the site into four blocks worked best with respect to meeting the unit and parking targets and accommodating non-residential uses including market-oriented development. I then evaluated three different courtyard configurations based on their ability to define shared space and optimize the relationship between units and streets. The inward-facing U-shaped blocks worked best as it accommodated wider courtyards and a pedestrian path through the centre of the site (see fig. 105).

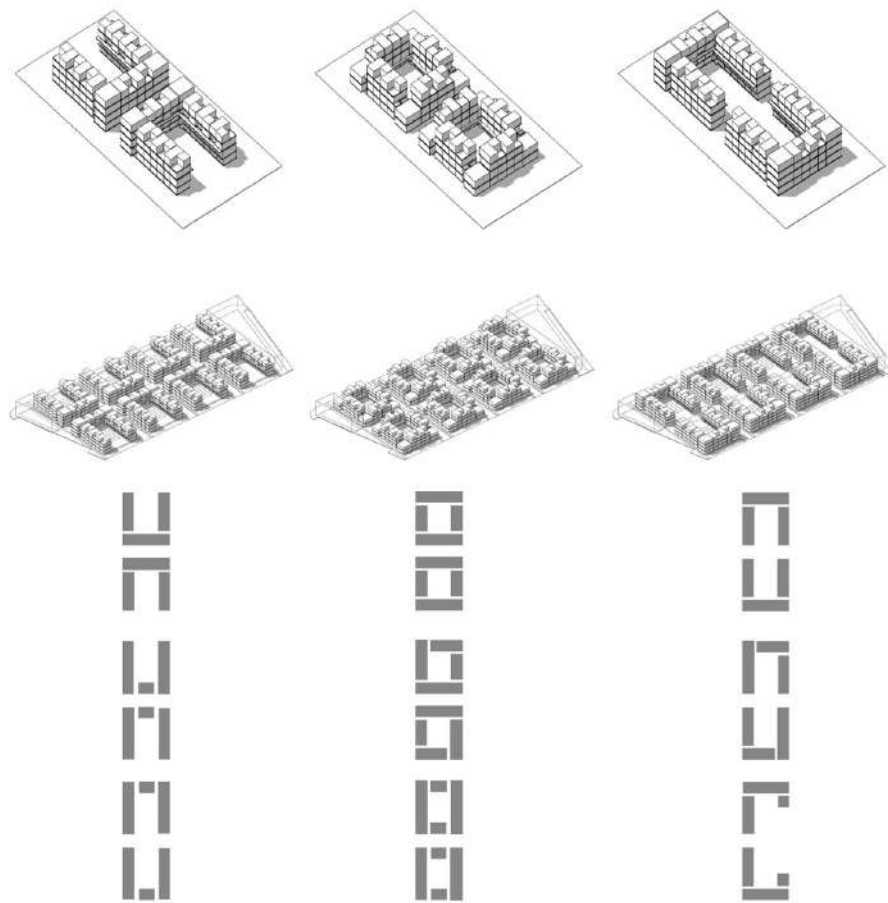


FIGURE 104 OPTIONS EXPLORED FOR SITE AND BLOCK CONFIGURATIONS

The final site plan was divided into four blocks, with a residual block facing the main road to the east; three of these blocks are rectangular and of the same dimensions while the westernmost block is slightly larger and trapezoidal in shape, following the boundary of the property.

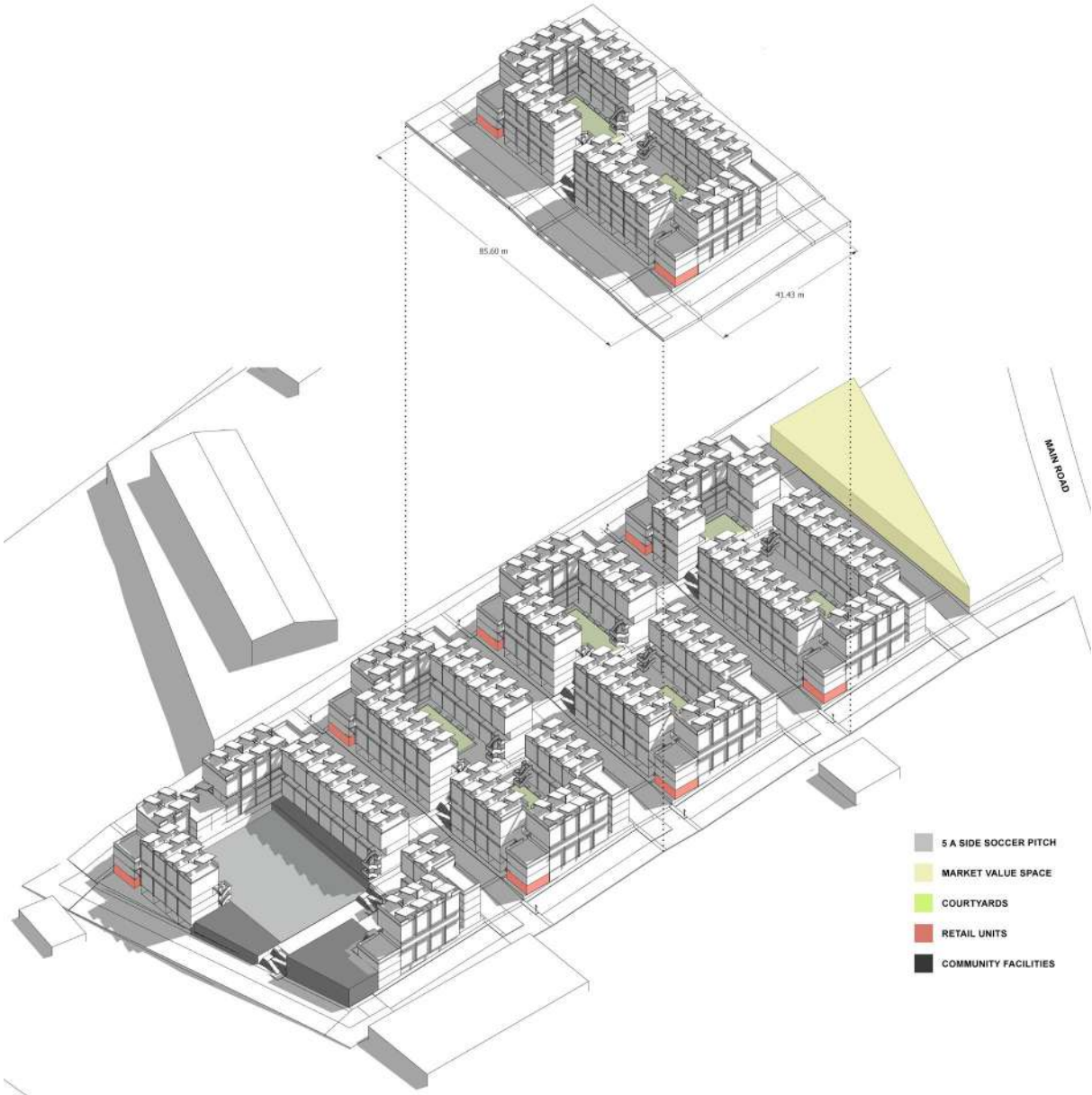


FIGURE 105 MASSING AXON OF SITE SHOWING PROGRAMMATIC ELEMENTS

In each block, buildings were organized around communal open spaces for gardens and leisure activity (see fig 106).

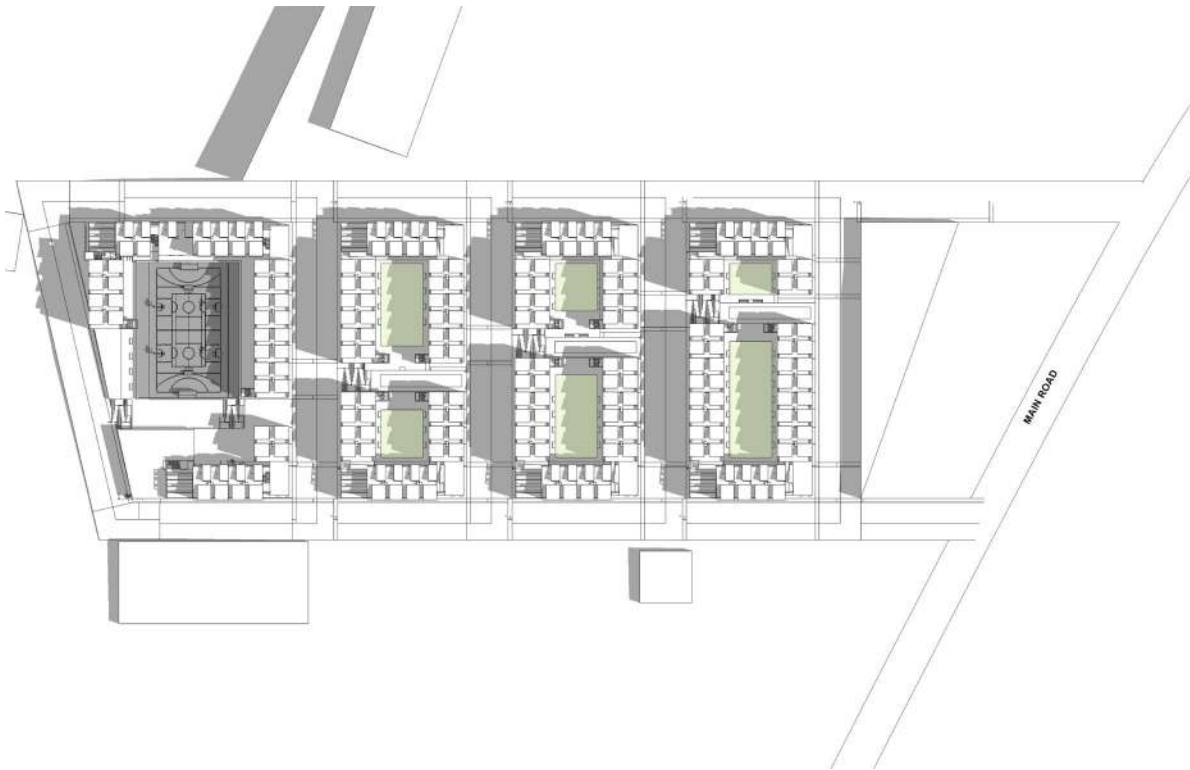


FIGURE 106 SITE PLAN SHOWING COMMUNAL SPACES

STREET GRID AND PARKING

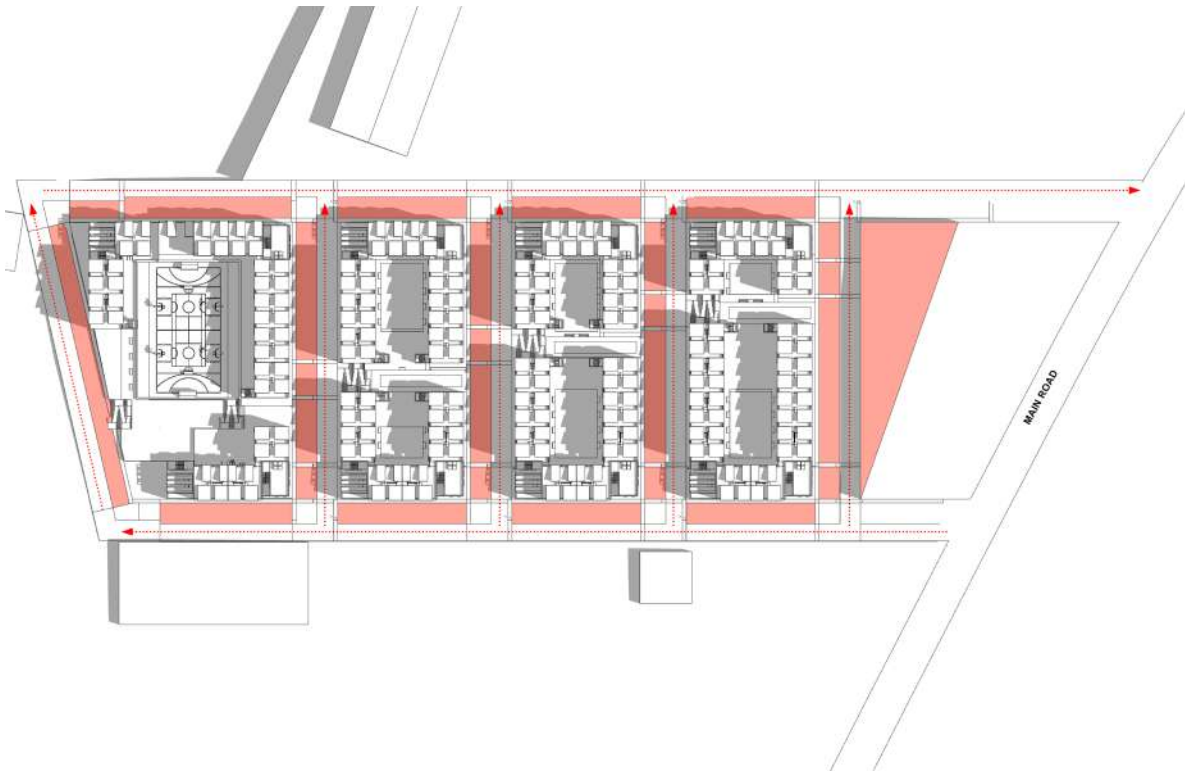


FIGURE 107 SITE PLAN SHOWING PARKING AREAS AND ROAD CIRCULATION

Decisions about the size of blocks and about the width, frequency and location of streets were made in relation to the property's size and proportions, and the high demand for parking. A one-way street system with head-in parking worked best for east/west streets while parallel parking was used for the streets running along the north and south edges of the site.

Due to the slope of the site; the downhill units have direct access to the street, while the uphill units are 1 storey above grade. To conserve space and leverage the change of grade across the site, parking garages were located below the uphill apartments at street level. These spaces could potentially transition into retail units over time.

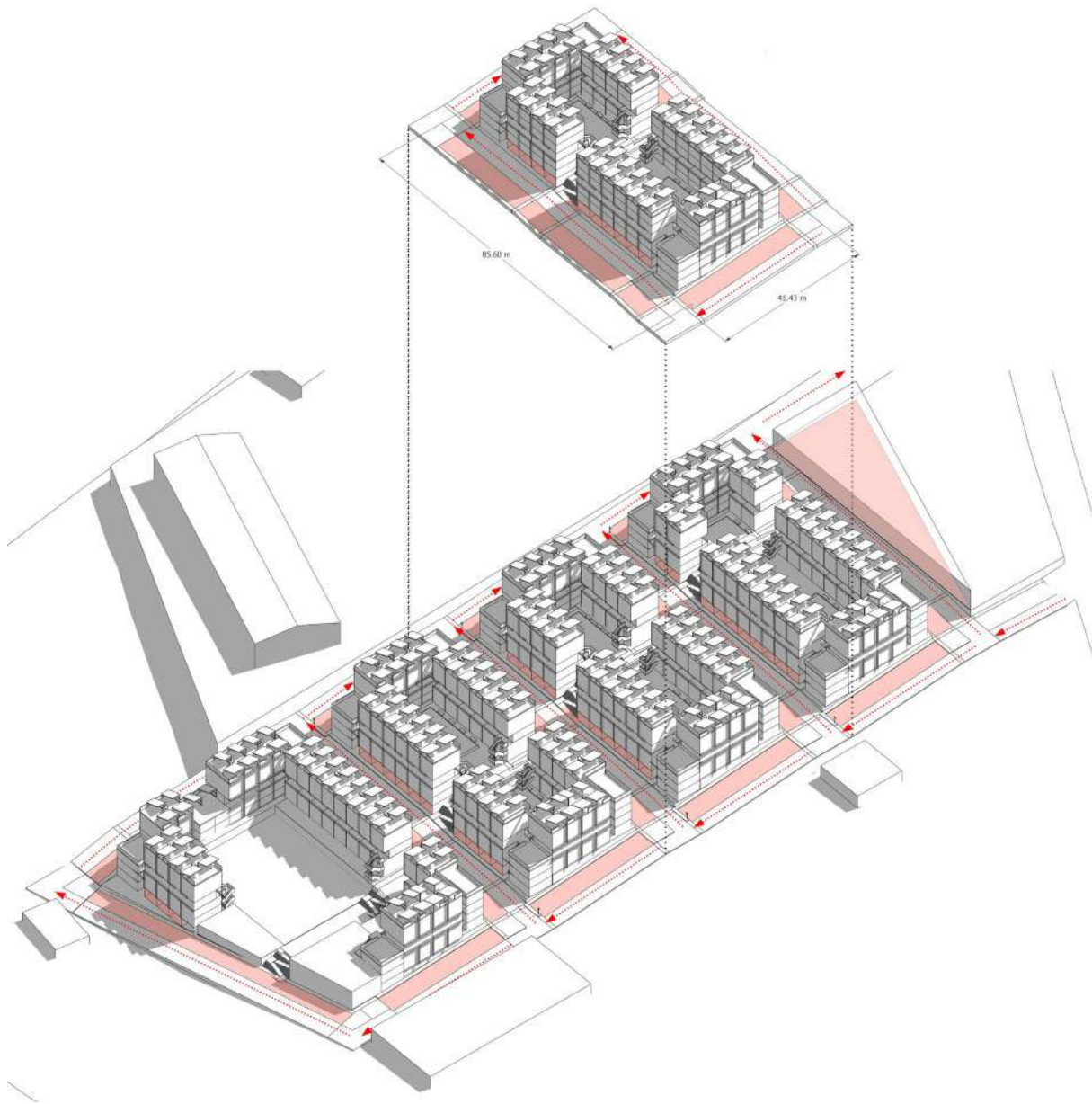


FIGURE 108 SITE AXON OF PARKING AND ROAD CIRCULATION

7.2 DESIGN AT THE BUILDING SCALE

While exploring housing prototypes for the site, I investigated a variety of permutations, both for the configuration of the units and the layout of circulation systems. These included A), point-access stair cores located between every other unit (two units per landing per core) to eliminate the need for corridors, B) flats served by exterior, single-loaded corridors on every level, and C) skip-stop systems serving multi-story units (with interior stairs) to obviate the need for corridors on every level.

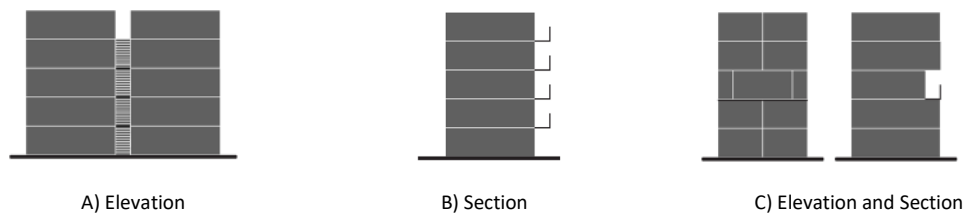


FIGURE 109 A) TWO UNITS PER CORE, B) FLATS STACKED AND SERVED BY SINGLE LOADED CORRIDOR, C) SKIP-STOP MULTI-STORY UNITS

Design decisions were based on the following considerations:

- Public circulation throughout the building should be external rather than internal. Corridors should be shaded to address the hot climate.
- Efforts should be made to reduce the number of stairs residents need to walk up in order to enter their units – with a preference for solutions that don't require corridors at every level.
- Open spaces located on upper levels should be used for socializing and for drying laundry. These spaces should be easily accessible to residents.
- There should be good visual surveillance of all open spaces and common areas from the units.

- Units should be designed to ensure privacy. Efforts should be made to prevent residents from circulating past private domestic spaces like bedrooms en route to their apartments.
- Accommodation should be made for storage tanks for potable water.
- Accommodation should be made for photovoltaic (PV) arrays and solar hot water panels.
- The design should incorporate ways to manage stormwater and wastewater
- The design should explore the retention and use of rainwater for garden-irrigation or cleaning.

The skip-stop multi-story units was chosen as the typical module for the composition of buildings (described further in the section below).

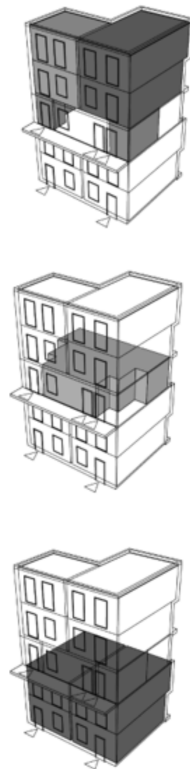


FIGURE 110 SKIP-STOP UNIT COMPOSITION

TYPICAL BAY MODULE



FIGURE 111 SECTION SHOWING STACKED CONFIGURATION OF UNITS, FACING NORTH

A combination of townhouses and flats was chosen to minimize the number of public corridors and stairs and to reinforce separation of private and public spaces. Buildings are formed from modules comprised of two, 2-story, 3-bedroom units (floors 4 and 5) stacked over a 2-bedroom flat (Level 3), over two, 2-story, 3-bedroom units (floors 1 & 2) – for a total of five units per five-story module. The lower townhouses (2-story units) are accessed directly from grade at the courtyard level, while the flats and upper townhouses are accessed by an exterior, single-loaded corridor on Level 3. Depending on where they are located, the lower townhouses may also be accessible from the adjacent street. All units are cross ventilated.

CORNER UNITS

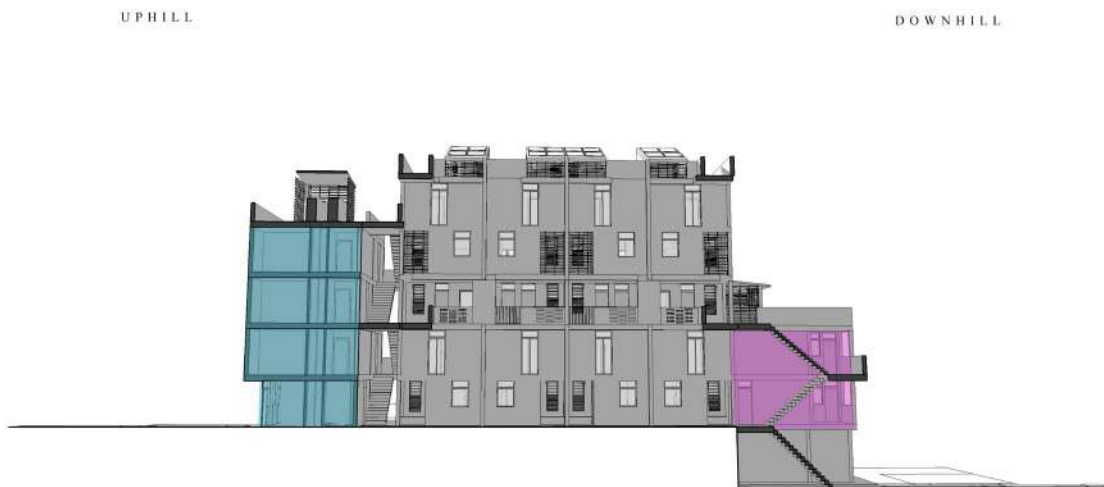


FIGURE 112 SECTION SHOWING CORNER UNITS FACING SOUTH

The clusters of corner units located at the intersections of north/south and east/west streets are comprised of stacked, two-and three-bedroom flats. On the western corners (uphill side) they consist of a retail unit at grade (one level below the courtyard), 2-bedroom flats on Levels 1 and 2, and a terrace on Level 3, accessible from the public corridor. The eastern corners (downhill side) consist of four stories of flats with a rooftop communal space at the 5th level.

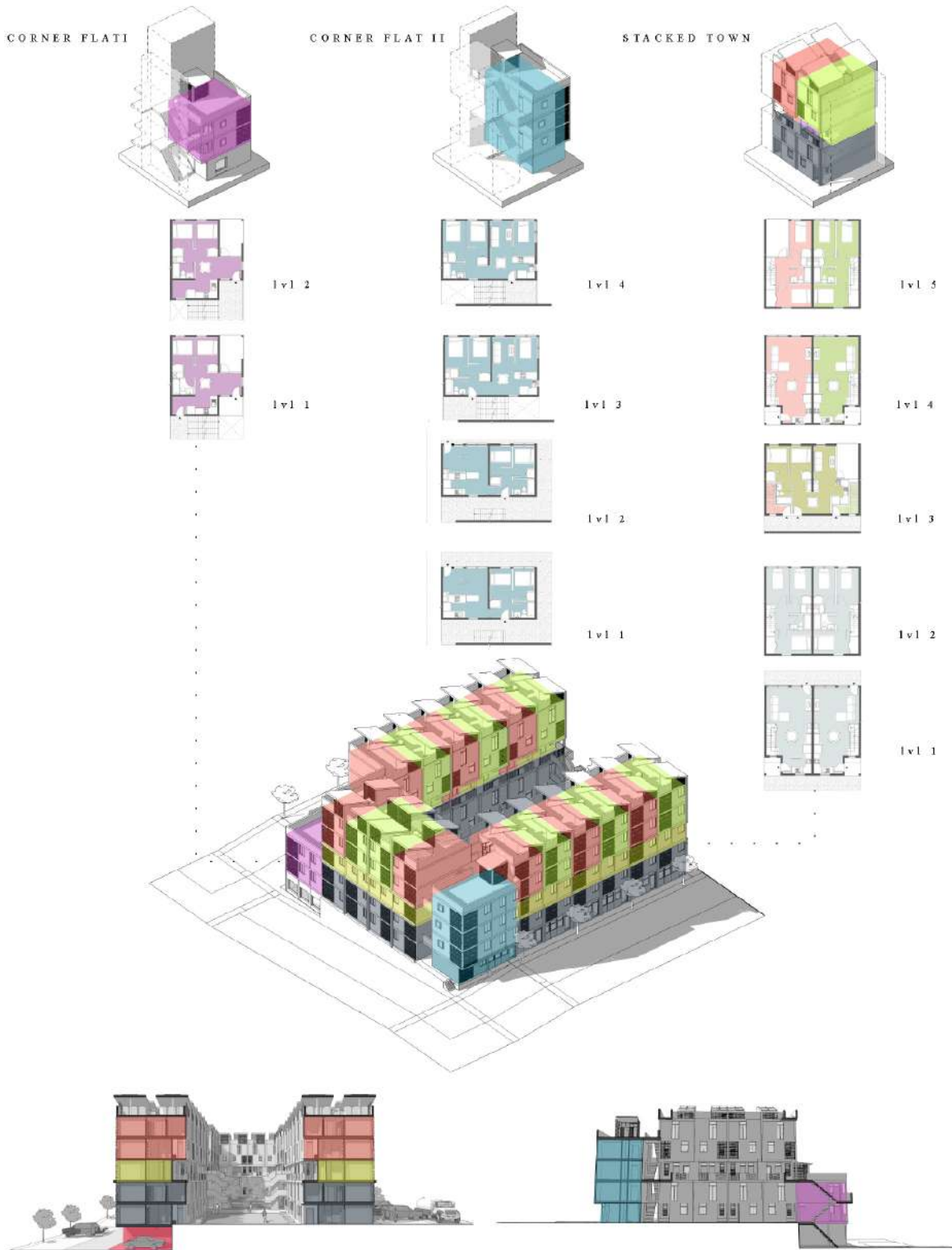


FIGURE 113 UNIT TYPES IN A TYPICAL BUILDING



FIGURE 114 STORAGE TANKS FOR POTABLE WATER LOCATED ON ROOF

WATER MANAGEMENT STRATEGIES

In Angola, units often incorporate storage tanks for potable water due to the unavailability of municipal drinking water. Water is delivered by trucks, which pump water up to individual rooftop storage tanks – one per unit, five per module. Locating tanks on the roofs enables the supply system to be pressurized by gravity, obviating the need for pumps to pressurize the system. Standpipe connections to these tanks are provided at grade (see fig. 114).

Cisterns for storm water will be provided underneath each courtyard. Additionally, the design leverages the natural slope of the site to drain excess storm water toward the 5-per-side soccer field during heavy rain events. The field is designed to double as a temporary retention pond.

As the site is not connected to any municipal sanitary sewer system, large septic tanks will also be provided under the courtyards. These tanks are pumped out periodically by trucks.

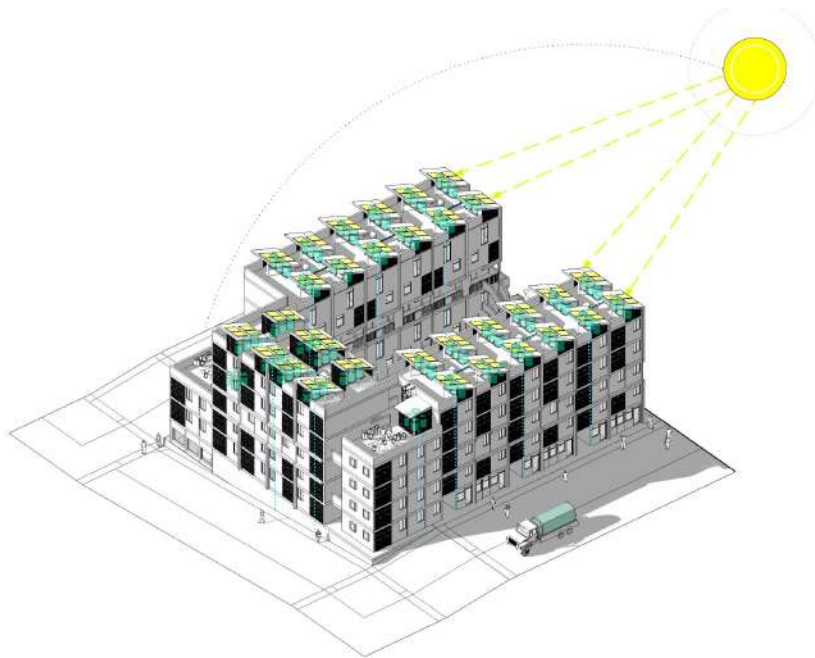


FIGURE 115 SOLAR ARRAYS LOCATED ON THE ROOF

SOLAR STRATEGY

Although it is likely that the site will be connected to a municipal power grid, electric service is sporadic in Angola due to rolling brownouts and other weaknesses in the system. As such it was worthwhile to explore the placement of PV arrays and solar water heating systems. Because Angola is located in the southern hemisphere, the roofs of the upper units were sloped towards the north to accommodate these arrays. The rooftop canopy also shelters the water tanks (see fig.115)

7.3 DESIGN AT THE UNIT SCALE

The following considerations guided the design of units:

- All units should be cross ventilated.
- All units should be entered directly from the exterior and the complex as a whole should be organized in such a way as to make it easy for visitors to locate units (i.e., pass the “pizza guy” test.
- The units should ensure privacy. Bedrooms and more private spaces should face away from public corridors.
- Unit plans should be organized to maximize flexibility and be easily sub-dividable. Static elements like kitchens, bathrooms, and staircases should be strategically located with respect to bearing walls and vent/plumbing shafts.
- Bathrooms should not open directly onto public rooms (i.e., living, dining or kitchen areas). All bathrooms should be vented.
- Each unit should have a dedicated exterior space. Exterior spaces should easily enclose to accommodate additional uses/interior spaces.
- Units should come in multiple stages and configurations of build-out to accommodate a multiplicity of need, uses and price points.
- To ensure privacy, bedrooms should not be directly adjacent to public corridors, walkways or stairs.

PRIVACY, FLEXIBILITY AND INCREMENTALITY

As the majority of units are configured as townhouses (2-stories with an internal stair), it was easy to organize them to avoid having bedrooms directly adjacent to public areas. In two-story units, bedrooms and bathrooms are located on the upper level, liberating the ground floor for more functions, including retail spaces in downhill units facing streets. In all flats, bedrooms were located away from public corridors and stairwells.

Incrementality has been incorporated into all units to accommodate flexibility. As noted, living spaces on grade-level units can be converted into street-oriented retail spaces, as can terraces (see fig 116). On upper levels, at least one bedroom in each unit has been left open as a terrace to reduce the construction cost and pass the savings on to the buyer. Owners can enclose these terraces to create additional bedrooms if and as they acquire the means (see fig 117). Similarly, bedrooms can be combined if household size decreases.

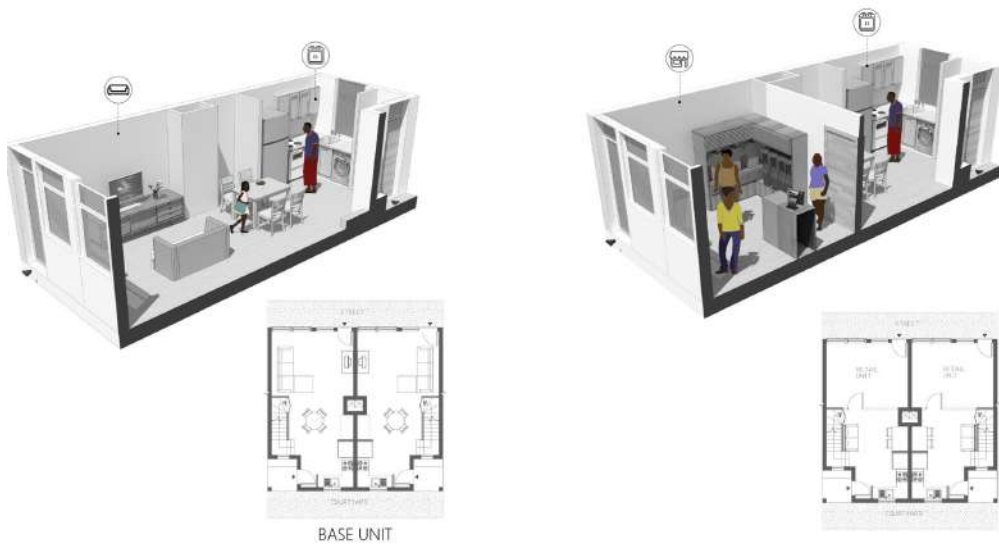


FIGURE 116 EXAMPLE OF A LIVING SPACE IN A GRADE-LEVEL UNIT CONVERTED INTO RETAIL SPACE

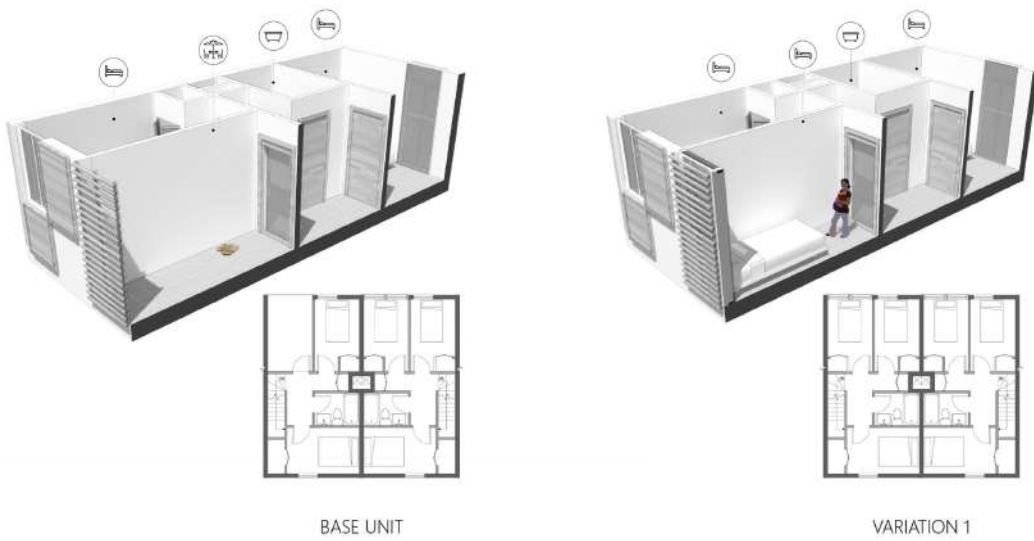


FIGURE 117 EXAMPLE OF A TERRACE SPACE ON THE 2ND FLOOR OF A TWO STOREY UNIT CONVERTED INTO AN ADDITIONAL BEDROOM

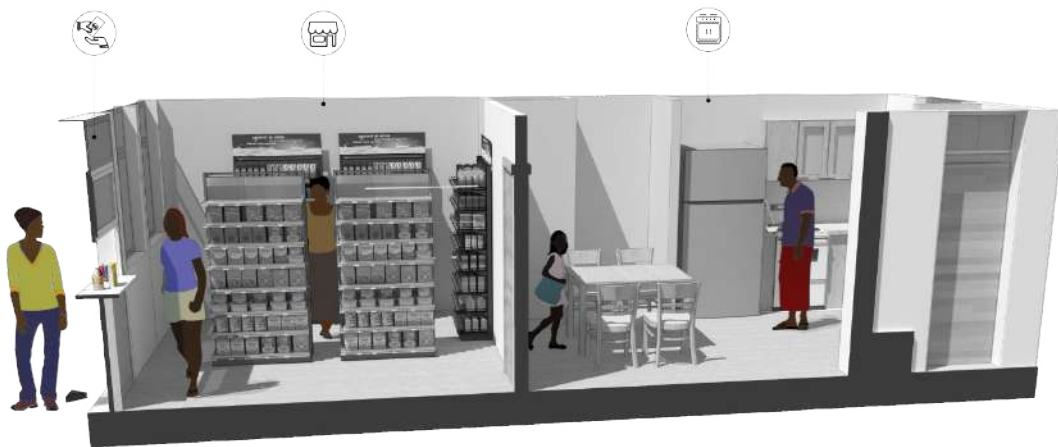


FIGURE 118 LIVING SPACE IN A GRADE-LEVEL UNIT WITH A PAYMENT WINDOW

Smaller street-oriented retail spaces may also benefit from a payment window for transactions. This feature could be fixed into the exterior wall or implanted into a door facing the street.

UNIT VARIATIONS

There are multiple variations of the standard 5-floor, 5-unit modules that comprise the bulk of the housing. Modules are typically 9.3 m wide and divided by a bearing wall (4.5 m between bearing walls). Bearing walls within modules incorporate a pipe and vent shaft that moves continuously up through the module. There are also variations for the corner units to which rows of modules connect to form courtyards. Depending where they are located relative to grade, units can be built out in different ways. Based on their needs, means and aspirations, buyers can choose from a number of options:

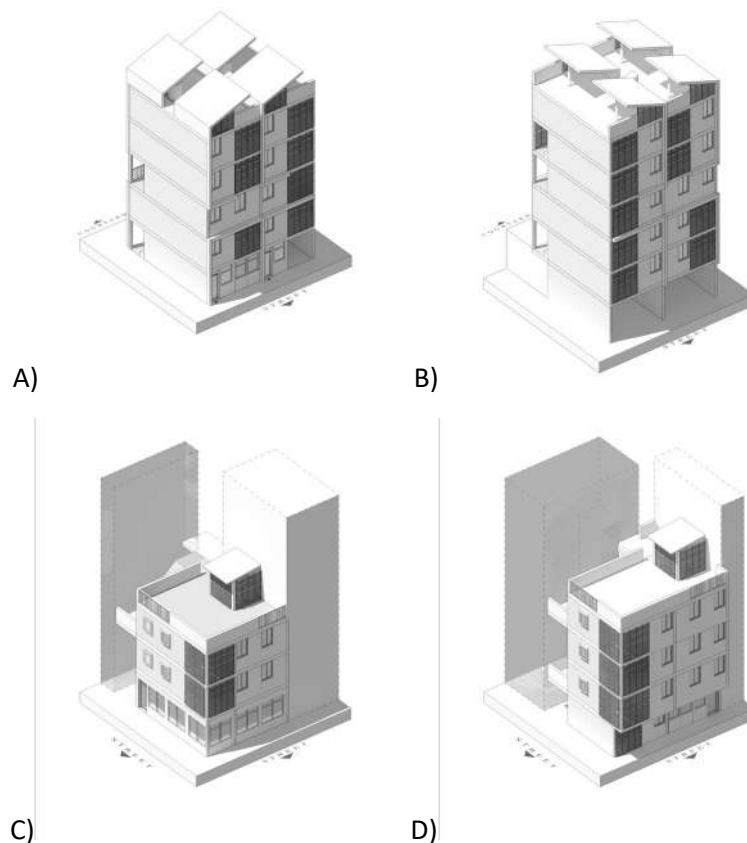


FIGURE 119 A) TYPICAL 5-UNIT MODULE B) TYPICAL 5-UNIT MODULE ABOVE GARAGE C) CORNER FLAT I D) CORNER FLAT II

TOWNHOUSES

(67.8 m²)

1. For the “downhill” units where the ground floor of the townhouses has direct access to the street at grade (courtyard is a same level as street):



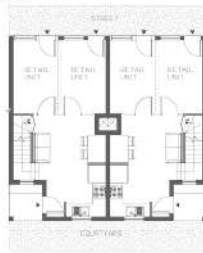
FIGURE 120 TYPICAL 5-UNIT MODULE FACING AN EAST/WEST STREET ON THE DOWNHILL SIDE
(COURTYARD AT SAME LEVEL AS STREET)
HIGHLIGHTING LOWER FLOORS OF LOWER TOWNHOUSE UNITS

LOWER FLOOR OF DOWNHILL UNITS



BASE UNIT

Fully enclosed as a large living room and a back door onto the street.



VARIATION 1

Fully enclosed; living area divided into two, street-oriented retail spaces. Living area moves to the center of the unit.



VARIATION 2

Fully enclosed; living area transformed into a street-oriented retail space. Living area moves to the center of the unit.

LOWER FLOOR OF DOWNHILL UNITS



VARIATION 3

Half enclosed with a living room and an open outdoor terrace. Door leading from the living room onto the street.



VARIATION 4

Half enclosed; living area transformed into a street-oriented retail space. Living area moves to the center of the unit.



VARIATION 5

Fully enclosed; terrace enclosed to become an extra bedroom and living area transformed into a street-oriented retail space. Living area moves to the center of the unit.

FIGURE 121 VARIATIONS OF THE LOWER FLOOR OF THE DOWNHILL UNITS

2. For “uphill” units, where the ground floor sits on top of covered parking stalls (courtyard is one level above the street):



FIGURE 122 TYPICAL 5-UNIT MODULE FACING AN EAST/WEST STREET ON THE UPHILL SIDE (COURTYARD ONE LEVEL ABOVE THE STREET; COVERED PARKING AT STREET LEVEL) HIGHLIGHTING LOWER FLOORS OF LOWER TOWNHOUSE UNITS

LOWER FLOOR OF UPHILL UNITS



BASE UNIT

Half enclosed with a living room and an open outdoor terrace.



VARIATION 1

Half enclosed; living area transformed into temporary extra bedroom. Living area moves to the center of the unit.



VARIATION 2

Fully enclosed; terrace enclosed to create an additional bedroom.



VARIATION 3

Fully enclosed; terrace enclosed to create an additional bedroom and living area transformed into temporary extra bedroom. Living area shifts into the center of the unit..

FIGURE 123 VARIATIONS OF THE LOWER FLOOR OF THE UPHILL UNITS

- The upper floors of the lower townhouse units (Level 2 – both uphill and downhill variations)



FIGURE 124 TYPICAL 5-UNIT MODULE HIGHLIGHTING UPPER FLOORS OF LOWER TOWNHOUSE UNITS

UPPER FLOOR OF THE LOWER TOWNHOUSE UNITS (LEVEL 2).



BASE UNIT

VARIATION 1

Half enclosed; two bedrooms and a terrace.

Fully enclosed; terrace enclosed to create a third bedroom.

FIGURE 125 VARIATIONS OF THE UPPER FLOOR OF THE LOWER TOWNHOUSE UNITS

4. The lower floors of the upper townhouse units (Level 4).

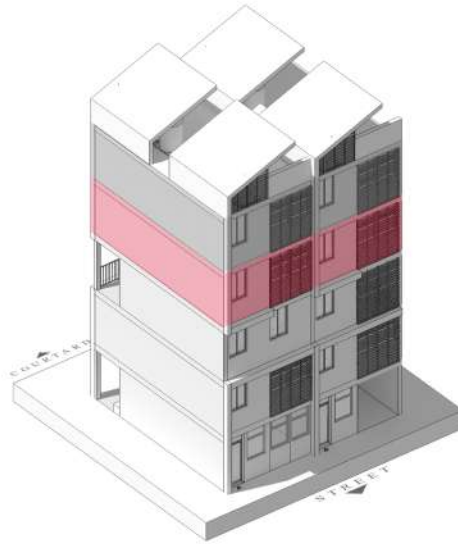


FIGURE 126 TYPICAL 5-UNIT MODULE HIGHLIGHTING LOWER FLOORS OF UPPER TOWNHOUSE UNITS

LOWER FLOOR OF UPPER TWO-STORY UNITS (LEVEL 4)



BASE UNIT

Half enclosed; living area and a terrace.



VARIATION 1

Half enclosed; living area transformed into temporary extra bedroom. Living area shifts into the center of the unit.



VARIATION 2

Fully enclosed; terrace enclosed to create an additional bedroom

FIGURE 127 VARIATIONS OF THE LOWER FLOOR OF THE UPPER TWO-STORY UNITS

5. The upper floors of the upper townhouse units (Level 5).



FIGURE 128 TYPICAL 5-UNIT MODULE HIGHLIGHTING UPPER FLOORS OF UPPER TOWNHOUSE UNITS

UPPER FLOOR OF THE UPPER TOWNHOUSE UNITS (LEVEL 5).



BASE UNIT

VARIATION 1

Half enclosed; two bedrooms and a terrace.

Fully enclosed; terrace enclosed to create a third bedroom.

FIGURE 129 VARIATIONS OF THE UPPER FLOOR OF THE UPPER TOWNHOUSE UNITS

MIDDLE FLAT

(48.5 sq. m)

6. The flats along the public corridor (Level 3) that sit between the upper and lower townhouse units. Note, internal stairs to the upper townhouses are accessible from the corridor on Level 3.

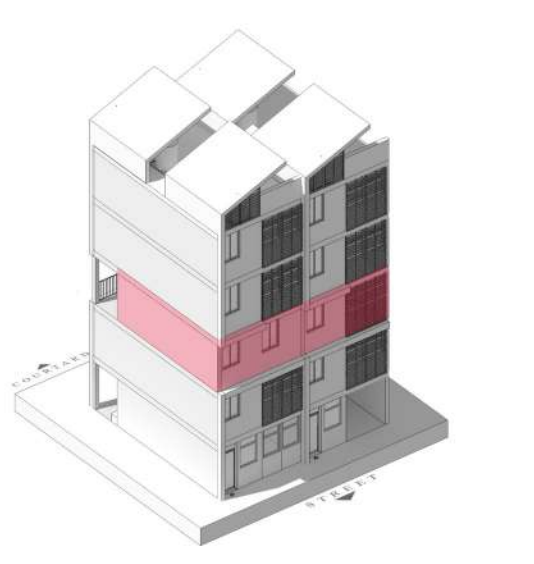


FIGURE 130 TYPICAL 5-UNIT MODULE HIGHLIGHTING LEVEL 3 FLATS

MIDDLE FLAT (LEVEL 3)



BASE UNIT

Semi enclosed; two bedrooms, living area and a terrace.



VARIATION 1

Fully enclosed; terrace enclosed to create an additional bedroom.

FIGURE 131 VARIATIONS OF THE LEVEL 3 FLATS

CORNER FLATS I

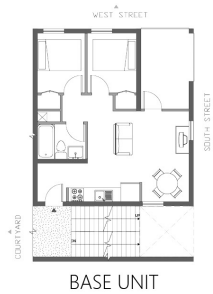
(44.4 sqm)

7a. Corner flats adjacent to the western stairwells above grade (1st level):

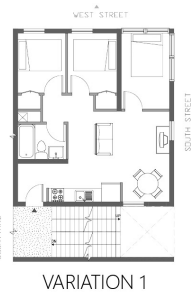


FIGURE 132 TYPICAL MODULE, STACKED FLATS ADJACENT TO WESTERN STAIRWELLS (UPHILL CORNERS), FIRST LEVEL ABOVE GRADE SHOWN HIGHLIGHTED

UPHILL FLATS (LEVEL 1)



Semi enclosed with a living room and an open outdoor terrace.



Fully enclosed; terrace enclosed to create an additional bedroom.

FIGURE 133 VARIATIONS OF THE 1ST FLOOR UPHILL FLATS

7b. Corner flats adjacent to the western stairwells above grade (2nd level):

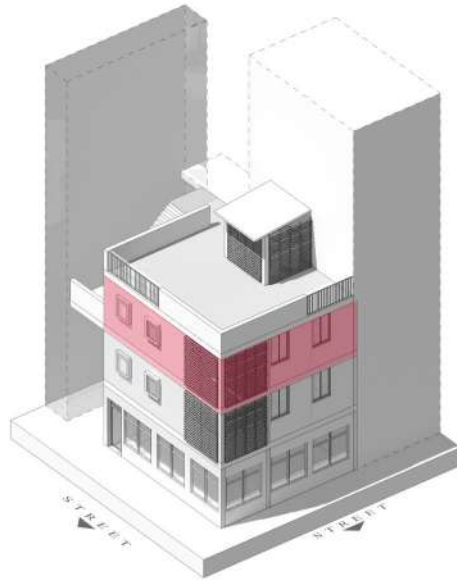


FIGURE 134 TYPICAL MODULE, STACKED FLATS ADJACENT TO WESTERN STAIRWELLS (UPHILL CORNERS), LEVEL 2 SHOWN HIGHLIGHTED

UPHILL FLATS (LEVEL 2)



BASE UNIT



VARIATION 1

Semi enclosed with a living room and an open outdoor terrace.

Fully enclosed; terrace enclosed to create an additional bedroom.

FIGURE 135 VARIATIONS OF THE 2ND FLOOR OF THE UPHILL FLATS

CORNER FLATS II

(41.4 sqm)

8a. Corner flats that line the eastern stairwells at grade:



FIGURE 136 TYPICAL MODULE, STACKED FLATS ADJACENT TO EASTERN STAIRWELLS (DOWNHILL CORNERS), LOWER LEVEL SHOWN HIGHLIGHTED

F1: DOWNHILL GRADE FLATS



BASE UNIT

Fully enclosed as a large living room and a back door onto the street. Optional enclosure of the living room to create the retail unit shown dotted.



VARIATION 1

Fully enclosed as a large living room and a back door onto the street. Optional enclosure of the living room to create the retail unit shown dotted.

FIGURE 137 VARIATIONS OF THE DOWNHILL GRADE FLATS

(48.4 sqm)

8b. Corner flats that line the eastern stairwells (2nd and 4th level):



FIGURE 138 TYPICAL MODULE, STACKED FLATS ADJACENT TO EASTERN STAIRWELLS (DOWNHILL CORNERS), LEVELS 2 AND 4 SHOWN HIGHLIGHTED

DOWNHILL FLAT (LEVEL 2 AND 4)



BASE UNIT

VARIATION 1

Semi enclosed with a living room and an open outdoor terrace.

Fully enclosed; terrace enclosed to create an additional bedroom.

FIGURE 139 VARIATIONS OF THE 2ND AND 4TH FLOOR DOWNHILL FLATS

8c. Corner flats that line the eastern stairwells (3rd level):

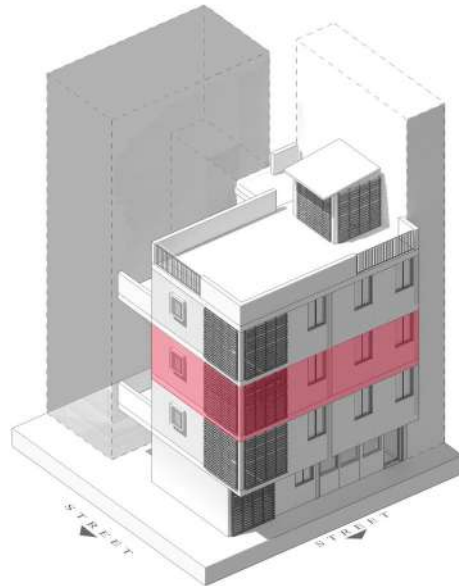


FIGURE 140 TYPICAL MODULE, STACKED FLATS ADJACENT TO EASTERN STAIRWELLS (DOWNHILL CORNERS), LEVEL 3 SHOWN HIGHLIGHTED

DOWNHILL FLAT (LEVEL 3)



BASE UNIT

VARIATION 1

Semi enclosed with a living room and an open outdoor terrace.

Fully enclosed; terrace enclosed to create an additional bedroom.

FIGURE 141 VARIATIONS OF THE 3RD FLOOR DOWNHILL FLAT

7.4 CONSTRUCTION

WALL TYPES

Consistent with techniques in Angola, four types of walls will be used for the construction of units.

1. Masonry Loadbearing Walls (those that support floors – which span between them). These are constructed of reinforced concrete blocks and are spaced 4.5 meters apart –the maximum span of the composite block-and-pre-cast-beam system which is the way floors are typically constructed in Angola.
2. Masonry non-loadbearing walls (those that sit on, rather than supporting, floors). These are constructed of either hollow-clay tile or compressed earth blocks (CEBs – described below). Surfaces facing the exterior will have a stucco finish while those dividing interior spaces will be rendered with plaster.
3. CEB or, infill panels – for interior partitioning only.
4. Exterior-grade non-masonry infill panels – for enclosing terraces.

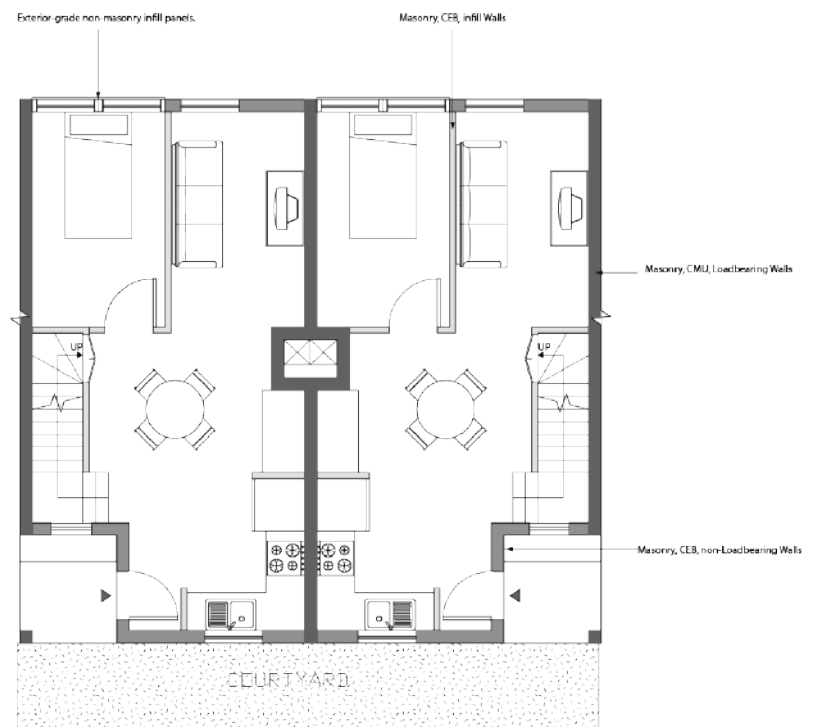


FIGURE 142 PLAN HIGHLIGHTING TYPES OF WALLS

INCREMENTAL BUILDING

Since the flexibility of unit's hinges on the ability of residents to subdivide interior spaces and enclose terraces, it was worthwhile to explore ideas on how both to manage and streamline incremental building activity. As the enclosing of terraces would have an impact on the overall look and integrity of the building, it was important to control/limit how infilling might be done. While the base unit would be built of masonry (as per above), infill panels would be made of a lighter weight material, possibly made from recycled paper.

INTERIOR ROOM SUBDIVISION

The interior spaces would offer occupants the most flexibility in subdivision as these spaces are under the direct control of owners. Nonetheless, subdivision of units was explored in the design to expedite the process and to assure that multiple permutations were possible based on a bay system for bedrooms and terraces. In effect, a subtractive approach was taken: while units were designed as fully enclosed/partitioned not all interior walls would be constructed at the time of the initial build. As such, residents can refer to plans to determine where additional partition walls might best be located. Given that stud walls are not typically used in Angola, it's assumed that residents would construct interior partitions of hollow clay tiles or compressed earth bricks, rendered with plaster. These building materials could be purchased in bulk by the community association and made available to owners at a discount. Of course, residents would also be free to use less permanent materials to subdivide their spaces, including the panelized interior partitioning system described below.

EXTERIOR TERRACE ENCLOSURE

As mentioned in Section 5, rules would need to be imposed to guide the enclosure of outdoor spaces inasmuch as what individual residents might choose to do will affect the appeal and salability of the ensemble as a whole. Below I outline four scenarios for enclosing exterior terraces. Guidelines/permissions controlling the enclosing of terraces could be overseen by a homeowners association (HOA).

Approaches to managing terrace enclosure are as follows:

- a) Anything goes approach: Occupants can use any material they choose to enclose terraces. That said, an ordinance may be imposed that enclosures conform to certain standards/proportions, etc. to maintain unity in the building.
- b) Standardized modular panel system: Occupants use an approved standardized system of façade panels that can be easily installed. These panels could come prefabricated with windows and doors.
- c) Standardized construction material and rules: Occupants may only be allowed to use approved materials for the enclosure of their terraces. An ordinance may be given that all terrace enclosures must be given certain features to maintain unity in the building.
- d) A blend of a, b, and c.

While in all approaches, the use of a standard floor-to-ceiling balcony guard to enclose terraces would provide some degree of unity to the building exterior, (façade additions would be placed behind balcony louvres – see fig 143 and 144 for example), options b and c would be the most preferable in order to ensure that the enclosure of terraces is carried out with consideration for the aesthetic integrity of the ensemble as a whole.



FIGURE 143 FLOOR-TO- CEILING BALCONY WITH LOUVRES IN THE KILUMOSO CENTRALITY IN UÍGE, ANGOLA

STANDARDIZED MODULAR PANEL MATERIALS

With respect to a modular panel approach for subdividing and enclosing space, the goal would be to create a system that makes it both easy and cost-effective. These panels might be made of a lightweight material and be designed to be installed without skilled labor. Below I investigated two new material technologies that may be used for both interior and exterior versions of the panels.

CELLULOSE PANELS

At Carleton, research has been conducted by fellow M.Arch. student Jesse Bird in collaboration with the company Zeoform using lightweight but strong cellulose material made from recycled paper fiber.

Mr. Bird provided the following description of the material:

Zeoform and current research at Carleton university is able to produce a variety of density outputs depending on the refining time, drying time, and

methods of molding the material. With the output densities ranging from that of Styrofoam to the strength of carbon fibre, the material is suitable for a variety of uses, contexts, industries and makers alike. This project will use this range of densities to create bio-engineered exterior sheets and insulating boards fit for a circular economy.

Initial tests done by the Zeoform team have been able to show the baseline testing results for the product in select conditions. Fiber types are first cut into 20mm x 20mm pieces using a decorticator and blended through a simple refining process, similar to what is used for paper-mache. Unlike traditional paper making processes, the pulp is sheared down to the micro and nano scale using a pressurized high-speed refining disk and mixed only with water.⁹⁵

With respect to the panel strategy, cellulose sheets could be cut into 1m x 2.4m panels that come in multiple variations, e.g., with and without windows and doors. The panels would then be slotted into rails embedded in the floors of the units and/or fastened to the vertical bars of the balcony guards for support.

⁹⁵ Description of Zeoform from Jesse Bird

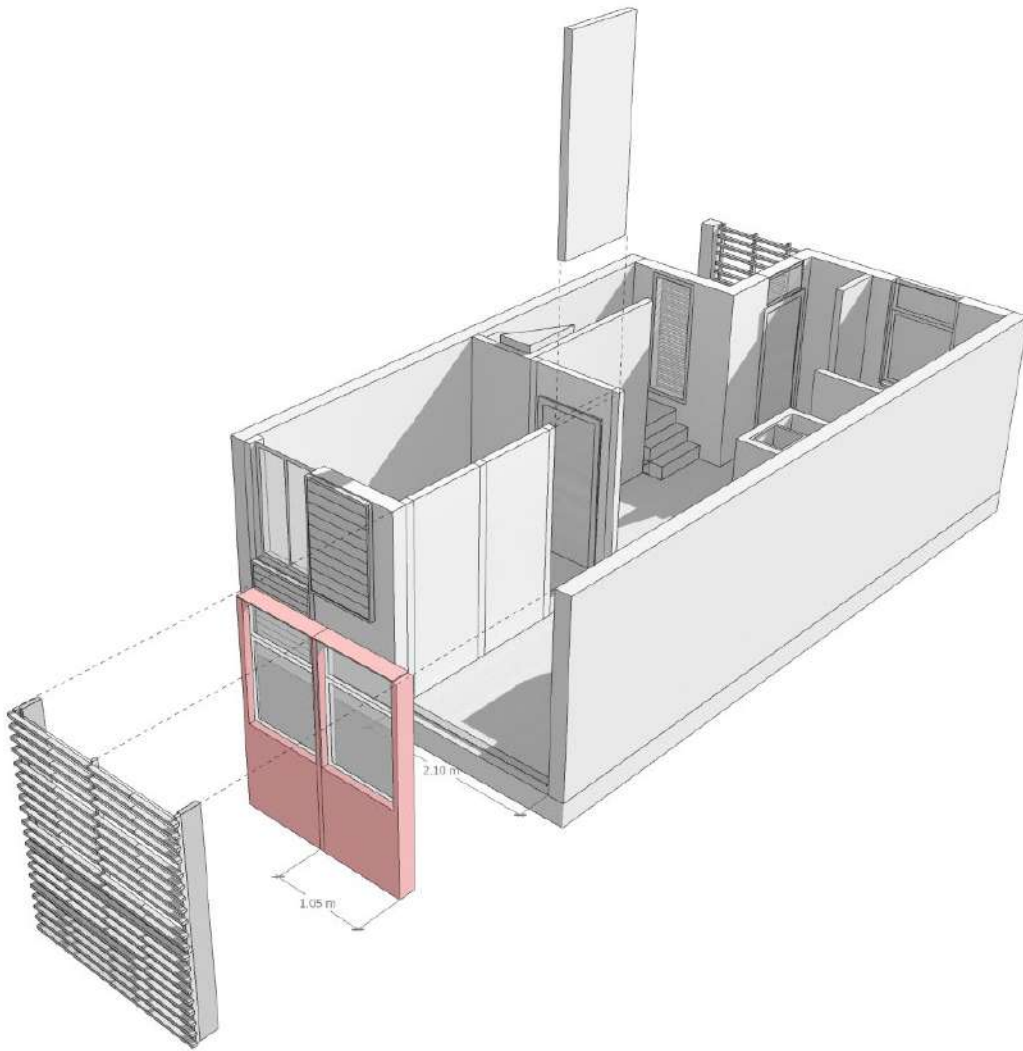


FIGURE 144 EXPLODED DIAGRAM OF EXTERIOR AND INTERIOR PANELS IN A UNIT



FIGURE 145 IMAGE OF DIFFERENT MODULAR BUILDING MATERIALS

HABITERRA SOIL BLOCKS

As noted in Section 2, Habiterria has pioneered an interlocking modular soil block that comes in multiple sizes and can be easily installed without mortar by unskilled labor. Habiterria has used these bricks in previous affordable housing projects in Angola, e.g., Huambo. Although the blocks are not structurally suitable for 5-story bearing walls, the blocks could be used both for enclosing terraces and the subdivision of rooms. The composition of the CEB (compressed earth block) is 10% cement, 30% sand, and 60% clay.



FIGURE 146 IMAGE OF VARIOUS SOIL BLOCKS USED IN ANGOLA

A brief description on the soil block from Habiterra is as follows.

The Habiterra block is a suitable replacement for the standard concrete masonry unit (CMU). Habiterra blocks can be installed by unskilled labor quickly – at a rate 10 times faster than a standard concrete block. Habiterra blocks are easier to install because they are mortarless. Proper alignment is ensured because the blocks are self-aligning and interlock both horizontally and vertically. Plus, the design of the units eliminates the need for heavy equipment, prefabricated components and pilasters or columns at the intersections. Rebar and concrete filled in every four feet (120 cm) o.c. provides additional stability as required. Since all units fit precisely into a 40 x 40 cm grid the blocks do not need to be cut. This saves a tremendous amount of time and money on the jobsite. The modular design of the units allows complete design flexibility, including door and window jambs and any required intersections... Projects constructed using Habiterra block can easily be waterproofed and/or insulated with Habiterra's proprietary technology. The blocks provide a natural thermal barrier.

The Habiterra blocks' interlocking characteristics ensure a greater seismic resistance than a conventional CMU structure. ⁹⁶

Using the soil brick approach, the block would then be slotted into a sealable groove embedded in the floors of the units to outline flexible spaces

⁹⁶ "About," accessed April 5, 2020, <http://www.habiterrabuildingsolutions.com/about.html>.

7.5 DESIGN ON A TEMPORAL SCALE

ADAPTING PARKING BELOW UNITS



FIGURE 147 UPHILL ELEVATION HIGHLIGHTING PARKING GARAGES AT STREET LEVEL



FIGURE 148 UPHILL ELEVATION PARKING GARAGES AT STREET LEVEL CONVERTED INTO STORES

As mentioned in previous sections, the goal of the project is to accommodate incremental growth throughout the development's lifespan to meet the changing needs of its community members. The uphill parking garages are an aspect of the design that can transition overtime. As car dependencies decrease, they can transition into stores and workspaces at street level (See fig. 147 and 148).

SITE BUILDOUT STRATEGY

The following are two strategies for the sequencing of the buildout of the site:

OPTION 1: STARTING WITH THE COMMUNITY-CENTRE BLOCK (BLOCK 5)

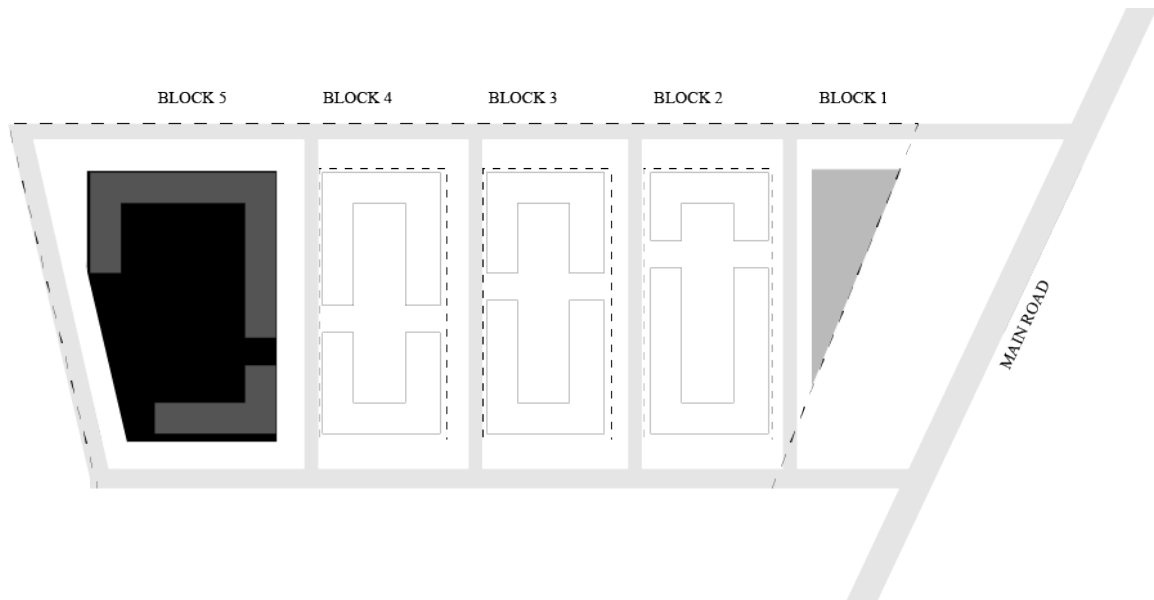


FIGURE 149 DIAGRAM OF THE SITE BUILDOUT STARTING WITH BLOCK 5

In this option Block 5, which includes 72 units, the community centre, school, and the five-per-side soccer field would be the first block to be constructed. Launching the project with Block 5 might make it more attractive to buyers and facilitate community development. The social dynamic set by the early community formed in this block may set the tone for future blocks.

OPTION 2: STARTING WITH BLOCK 3, THEN 4, THEN 5 AND FINALLY 2.

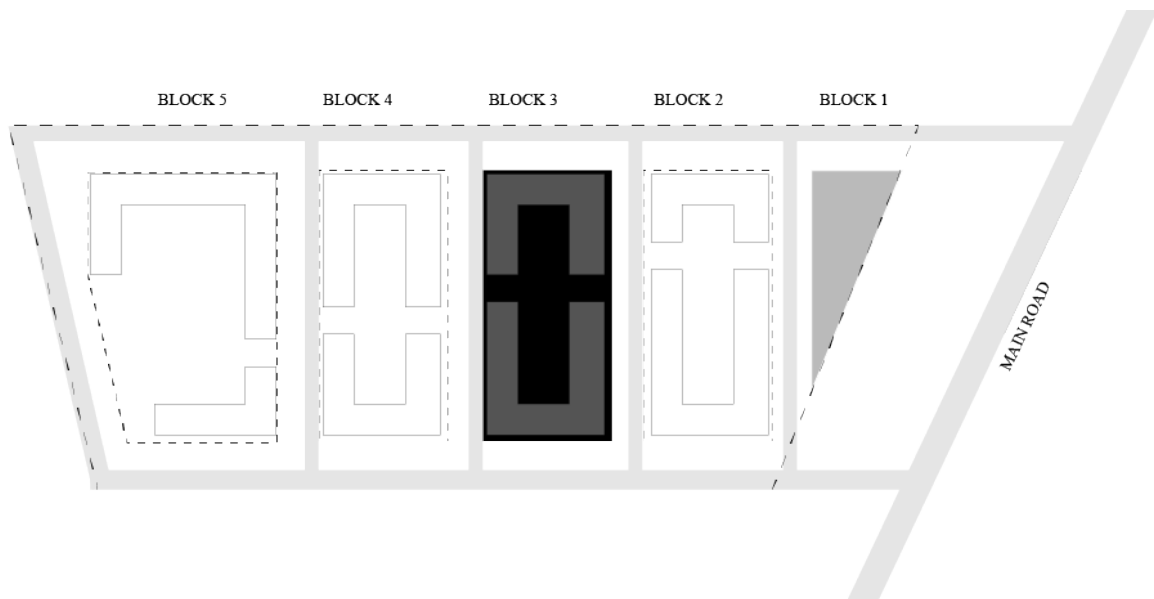


FIGURE 150 DIAGRAM OF THE SITE BUILDOUT STARTING WITH BLOCK 3

This approach would be the most affordable inasmuch as Block 5 would be the most expensive to build. Revenue generated from the sale of units in Blocks 3 & 4 could offset the cost of the community facilities associated with Block 5.

In both approaches Block 2 would be the last to be built out. Being at the highest elevation and closest to the main road, it is the highest value in terms of land cost. It could be treated as a contingency to be redirected to market-oriented housing should circumstances demand. Recommendations for the development of the triangular plot (Block 1) that separates Block 2 from the main road – also part of what DW owns -- are described below.

PROGRAMED BLOCKS

BLOCK 1 - MICRO ENTERPRISE - TRANSPORTATION

Although the Panguila site is served by a public bus, it is unreliable and irregular. In the short term, the triangular plot separating Block 2 from the main road may be paved and used as parking for a micro public transit station to service the residents of the DW development (and adjacent developments). Community members could be incentivized by businesses with microfinance loans to create services that benefit the community and, parking spaces could be set aside for the busses, van taxis, and moto taxis.

In the longer term this property might be given over to market-oriented retail uses, which generate rent for the DW complex. As this parcel abuts the main road, retail might be its highest and best use.

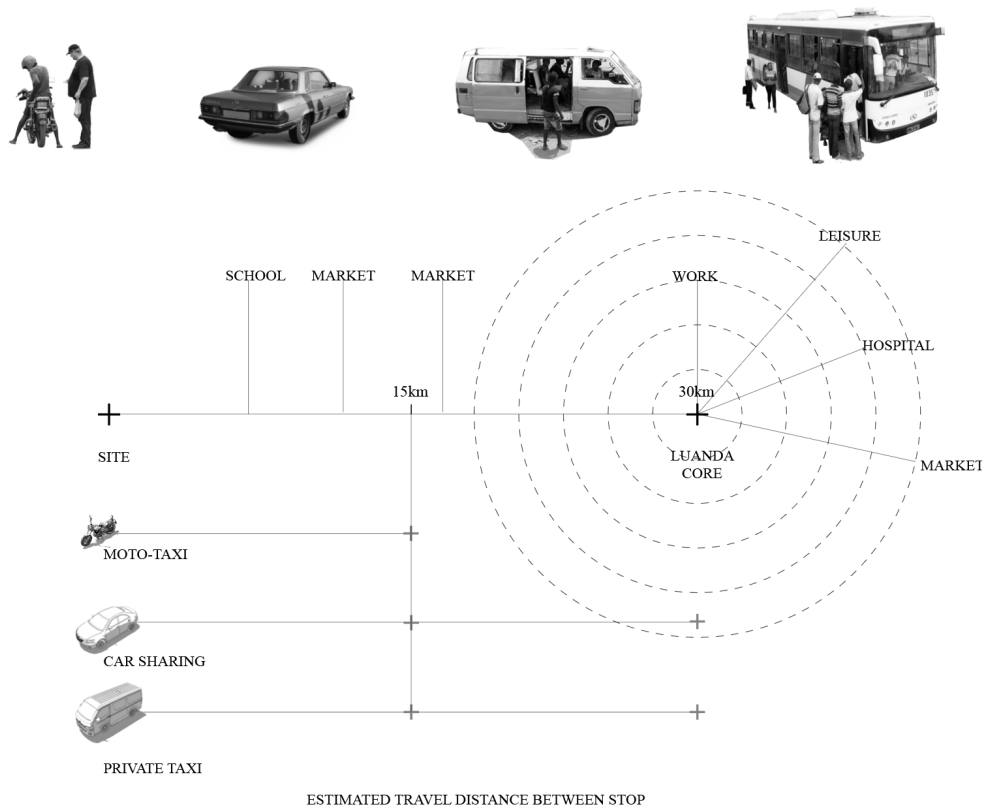


FIGURE 151 DIFFERENT TRAVEL METHODS IN LUANDA

BLOCK 5 – SCHOOL AND 5 A SIDE PITCH

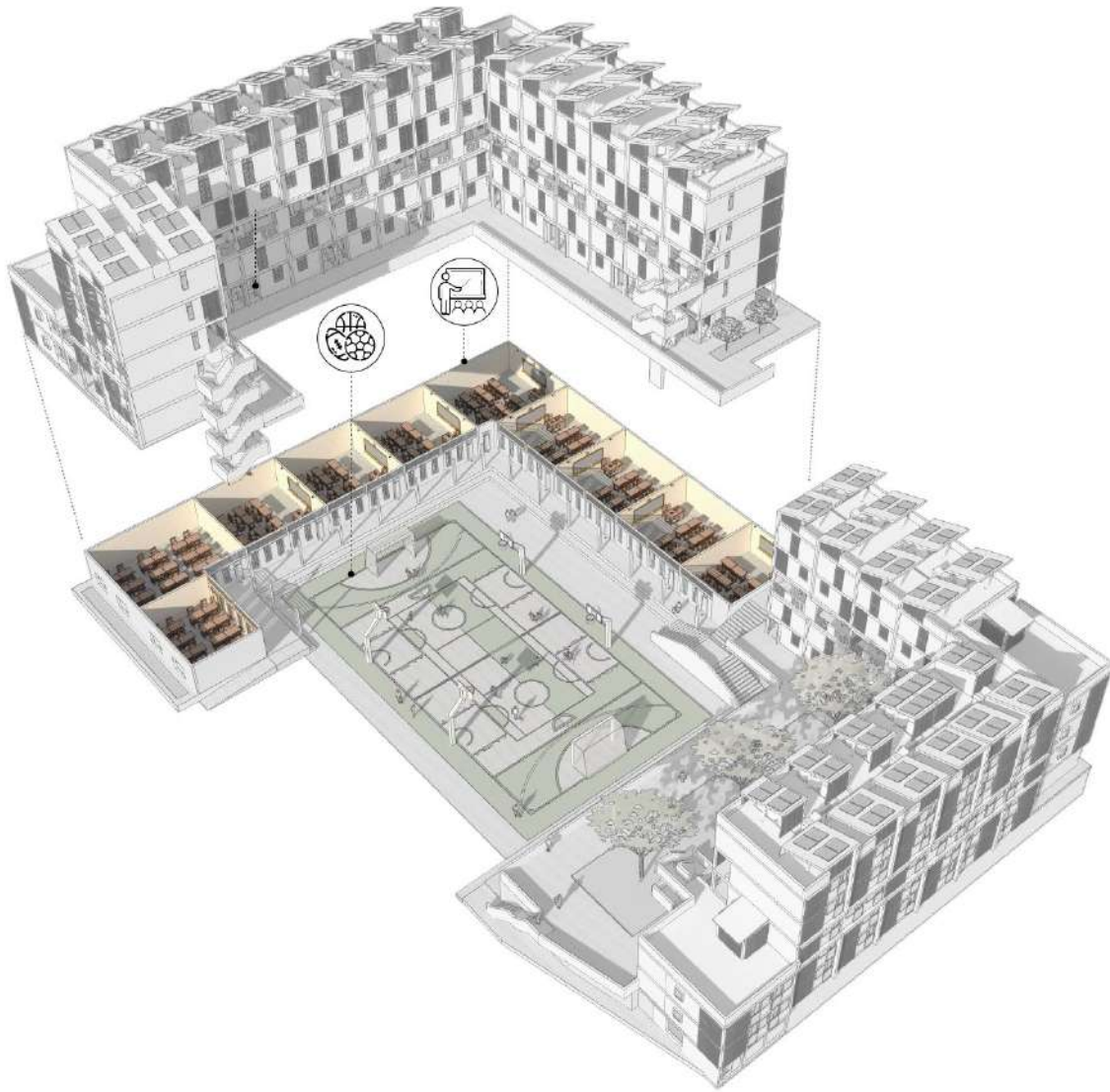


FIGURE 152 EXPLODED DIAGRAM OF BLOCK 4 CLASSROOMS

As mentioned in previous sections, Block 5 was envisioned to be the location for a school/community facility. To take advantage of the sites slope and provide space for a 5 a side pitch, classrooms were situated below the housing units but accessible from grade in a courtyard configuration.

FUTURE BLOCK EXPANSION

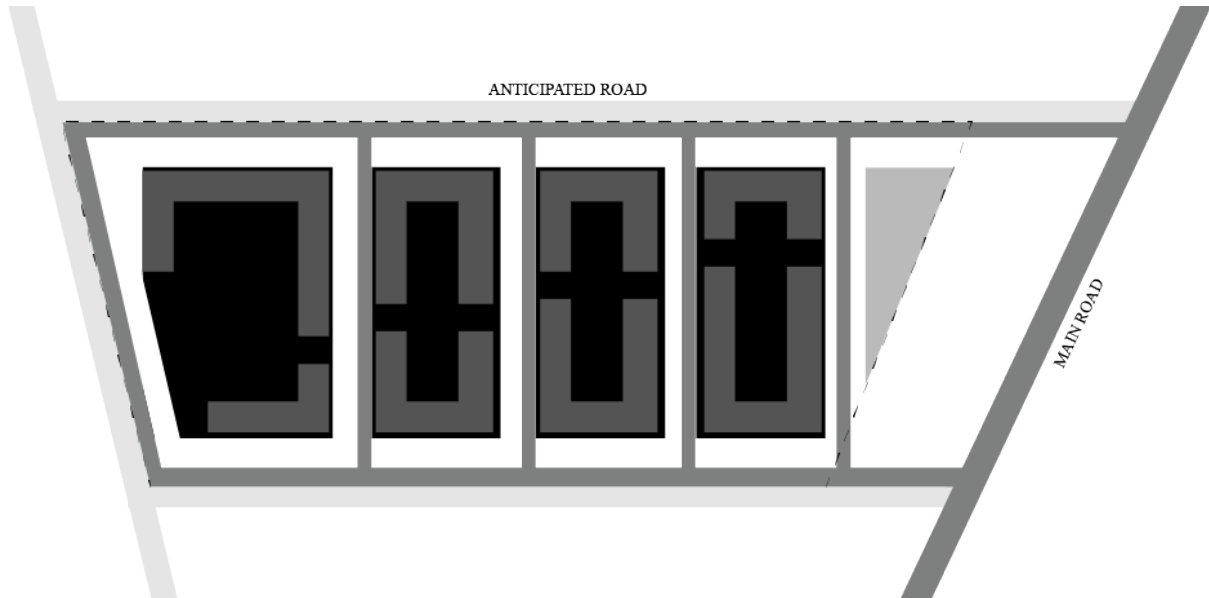


FIGURE 153 DIAGRAM SHOWING LOCATION OPTION OF ANTICIPATED ADDITIONAL LANES

As DW's site will likely be the first to develop in this area of Panguila, the project will set a precedent for the subdivision and build-out of adjacent properties. Defining block and road sizes which comply with agreed standards is critical for street grid extensibility and future urban development. While the north/south cross streets lie entirely within the boundaries of the site, the east west roads should be designed to straddle neighboring properties, which they will also serve. In the initial stages of the site's growth, the east/west roads along the perimeter of the property will be constructed as single-lane, one-way roads in anticipation that additional lanes will be built on the properties to the north and south as these properties develop. This is something that could be worked out with the municipality of Panguila, which has the right to expropriate land for roads that it will ultimately own and manage.

8.0 CONCLUSION

REFLECTION

Overall, in the 8 months of research for my thesis, my objective was to gain an understanding of the circumstances and socioeconomic activity that shaped Luanda's urban growth. I aimed to use the information I gathered from literary reviews, interviews, and travel to inform the design of a prototype for sustainable and affordable high-density housing on the city's periphery. The resulting project for the most part succeeded in meeting the challenges outlined by DW. The prototype designed shows that it is feasible to achieve the high unit target goals at a building height that would obviate the need for elevators with the added ability to promote community and commercial activity. In addition, the site can be built out incrementally over time. One does not need to finance the entire project as a whole and may just need financing for a single block in the early stages of development.

One notable criticism of the project however is that it is quite separated from the city and is relatively different from the single-story neighborhoods in Panguila. As a result, the higher density multi-unit housing will stick out like a sore thumb. The question then becomes whether the project will be built for a current or future context. The prototype could work for both the former and latter; as an integral part of the new developments arriving to Panguila and as a catalyst for future growth around the area. From a practical standpoint the next step for the project would be to develop a Pro Forma in consultation with somebody who would understand the interest and financing side of the project. This may help the project get further funding from social investors such as REALL, a social investor whose previous work with DW focused on creating housing in the city of Huambo, where over 150 homes

have been completed to date.⁹⁷ This phase of the project would be dealt with by DW.

It is also important to acknowledge towards the end of my research that the world has undergone a massive health and economic crisis. This will have an impact on affordability and sociopolitical stability in Angola for the foreseeable future. The price of oil, Angola's primary export, has dropped dramatically due to the 2020 pandemic and many businesses are forced to close or operate at reduced capacities. The impact of these factors will surely compound issues that are currently impacting the nation which was already in recession. The terms of reference for which this project was built on in the past will need to be reviewed again, however, the fact remains that people are still in much need for affordable housing as the demand is very high.

Furthermore, there are a few additional details that would need to be considered for the project that were not fully touched on in the design proposal. First, the project was not able to deliver a concrete solution to reach the 1 parking space per unit targets. Although a micro-public transportation system was proposed to alleviate the need for private vehicles, one suggestion might also be to use the unfinished or empty blocks in the project's phased buildout as additional parking if needed. Someone in the future may also open parking on adjacent land if the demand is high for the community.

Second, as mentioned in the previous chapter; the project primarily uses a 4.5 grid between bearing walls, but this may not be suitable for the uphill parking garages throughout the site or the classrooms in block 5 under the housing. In the design It

⁹⁷ "Angola — Reall Website," accessed May 27, 2020, <https://www.reall.net/data-dashboard/angola/>.

was favorable to expand the grid module from 4.5m to 9m for these underground modules, but this change will require a different building system such as poured in place reinforced concrete.

Finally, it would be important to consider how quickly communities transform as homeownership will hasten development on the complex. The uphill parking garages may rapidly transition into shops and workspaces and this may inform the implementation of future blocks throughout the site's buildout. There is also significant potential to capitalize on the views of the ocean from the site as buildings overlook the sea towards the west. This should be considered for the price of certain units that have these views and the development of the market value space in block 1 near the main road. Developers may want to consider building a higher structure to take advantage of these views.

FUTURE WORK

As observed from the interviews and analyses outlined in this thesis, there is dire need for affordable housing, but there is also a severe need for infrastructure, schools, community facilities, and hospitals. Water, waste disposal, security and public transportation are also major topics that could be further explored. Future research may elaborate on these components listed above as complementary parts of community design and development in Luanda.

9.0 RENDERS



FIGURE 154 PERSPECTIVE VIEW FROM BLOCK 5



FIGURE 155 AGGREGATION OF SITE ACTIVITY VIGNETTES WITH SITE SECTION



FIGURE 156 AGGREGATION OF BUILDING ACTIVITY VIGNETTES



FIGURE 157 VIEW LOOKING PATH FROM THE 5 A SIDE PITCH IN BLOCK 5



FIGURE 158 VIEW LOOKING TOWARDS THE SOUTH AT THE DOWNHILL UNITS FROM A STREET BETWEEN BLOCKS 2 & 3



FIGURE 159 VIEW LOOKING NORTH ALONG THE STREET BETWEEN BLOCK 2 & 3



FIGURE 160 VIEW LOOKING TOWARDS BLOCK 2 FROM PUBLIC TRANSIT STOP IN BLOCK 1



FIGURE 161 LOOKING SOUTHWEST INTO THE COURTYARD OF BLOCK 2 FROM AN OPEN CORRIDOR ON



FIGURE 162 LOOKING EAST FROM THE COURTYARD OF BLOCK 4 ALONG A PEDESTRIAN PATH INTO THE COURTYARD OF BLOCK 3



FIGURE 163 VIEW FROM A COMMON AREA SPACE ON LEVEL 3 OVERLOOKING A STREET BELOW



FIGURE 164 VIEW AT STREET -LEVEL LOOKING AT AN UPHILL PARKING MODULE THAT HAS CONVERTED INTO A STORE



FIGURE 165 VIEW OF LEVEL 5 COMMON SPACE BEING USED FOR LAUNDRY DRYING



FIGURE 166 VIEW FROM COURTYARD LOOKING TOWARDS UNITS

APPENDIX

INTERVIEWS

GENERAL QUESTIONS:

What are some positives and negatives about living in the area?

Where did you live prior to living here?

What changes would you like to see around your neighborhood?

How well do you know your neighbors? Do you feel like you belong to a community?

What are some amenities or public spaces that you would like to see closer to your area?

How long have you lived in this area?

Are you the owner or are you renting?

Is the house subdivided?

Do you like where you live and have your thoughts changed since you moved?

How many people are living with you on the property?

Are you an entrepreneur? Do you have any small business on the side? If so, what type of space would make running your business easier?

How long is your commute to work?

THINGS TO LOOK OUT FOR DURING NEIGHBORHOOD ANALYSIS

Is there electricity?

Is there water?

Is there Drainage?

Are there discernable/ maintained roads?

Is there a form of public transportation? Taxis, moto taxis, busses?

APPENDIX I

PANGUILA: SECTOR 1

Male

Homeowner

Community coordinator



FIGURE 167 STREET IN PANGUILA SECTOR 1

Q

Do you live in Panguila?

A

Yes, I do.

Q

How long have you lived here for?

A

11 years. The governor needed the area in the location I lived prior. They made us
and about 300 families relocate to here in Panguila.

Q

Do you enjoy living here now?

A

Yes, I do. This is the place where I grew up. We have hospitals, we have hotels, we have 3 pools, we have many places where people can enjoy themselves.

Q

How has the neighborhood changed since you started living here?

A

Markets have started arriving. Living here has been so nice even though we have problems with water, but it's good being here.

Q

What are the major challenges being faced here?

A

There are places with no running water. Like the school or houses.

Q

Do you anticipate these services coming soon?

A

Yes, because the governor has come here last year. He said that these problems will be solved and are being worked on. For example, there is some flooding.

Q

Do you know your neighbors well?

A

Yes, I know my neighbors well. I am a coordinator for the place where I'm living. I have 16 720 people depending on me as a coordinator.

Q

What are some typical tasks people ask of you as a coordinator of the community?

A

They ask me to solve problems with water, problems between neighbors, kids not going to school and university advice. I am the one who takes these issues to the administration so they can solve these problems. One problem now is we have had a lot of people dying.

Q

Are these issues getting worse?

A

Sometimes. We had a problem where a woman died and left 5 children. Each child had a different father. We had to intervene and bring this up to the governor.

Q

May I ask you questions about your home? Are you the only family living in your house?

A

For me we are one family in a house. Although we had this problem 3 years ago where there were three families living in a house. Now these people are living in their own houses.

Q

How many family members typically live in a household?

A

Culturally most African families are very big. I have a family of 6 but most consist of several members. Others can be as big as 15 or 16.

Q

Are you the owner of your property?

A

Yes, but I do not own the land. It belongs to the state. I own the house.

Q

Are you an entrepreneur? Do you own a small business?

A

Yes, but it's not close to my house. Its closer to main the road.

Q

Do most people have small businesses?

A

Yes, but most do it from their house. In some houses they have three rooms and they use one for work.

Q

How long is your commute to work?

A

5 minutes. I work in Panguila.

Q

Do you go into the city often?

A

Sometimes, mostly for pleasure at *Ilha de Luanda (coastal beach area near downtown)*.

Q

What are some changes you would like to see in your neighborhood in terms of amenities and public spaces?

A

You know Angola is facing some difficult times. People don't have much money and can't really invest in terms of community. I wish people here were more united than they currently are. We have many people who once lived on the street but grew up and now have families in Panguila. These people used to live in disorganized places but now they are here. They are no longer street kids. Now they are fathers, mothers, and community leaders.

They don't have those behaviors or issues from their extended family in the streets. "*Acu turea la familia*" but they no longer know their relatives. It's hard when someone's parents die here. They are disconnected from their roots. Those without families end up as children on the street.

To answer your question in terms of amenities; we would like spaces for entertainment, more schools and universities for adult education.

We have only one university in Panguila which is not of the state. A university would give more opportunities to residents here so that people can live here, learn here, work and create industries that create jobs. We heard that developments are coming such as Port Luanda in Barra Do Dande. We need our community to be ready. But until now we still have issues with water, electricity etc.

Q

Thank you for answering my questions. Do you have any final thoughts or questions for me?

A

There is the need to have this type of conversation for the building of a better community. We have many organizations who promise us things. There are people who are really in need of food, jobs, water. There are places you cannot

enter because it is not accessible by car. Some people have not eaten for 5 days. Women offer themselves for prostitution to feed their kids. There are kids that are skipping school to sell plastic and rubbish for food money. They are stripping wire also to sell. Kids are preferring to not go to school because they want to make money not for wealth but because they have nothing and want to feel as if they can have something. They have nothing at home. They go home and their parents have nothing to give them. I want this part of life to not happen anymore. I'm not saying that the government isn't treating us like human beings, I feel they are making an effort. I know and have been following their projects. The problem is we don't have places to work and the kids aren't going to school. The kids in the rubbish aren't doing this for fun. They are picking things to sell to help their families to have something to eat. Please take this research to a serious place. This is not a political problem. This is a living problem. We need to help these people and I need help. I need to know my brothers, neighbor, and people are alright. That makes me feel alright. The government did something. The government gave them a house. But they can't eat a house. They need to eat every day, but they don't have money every day. Some people are becoming gangsters, robbing people, being delinquents. They have been raised without guidance because their father doesn't have enough time to sit down and talk with them because they are working, in Luanda or looking for jobs. The life here starts so early. Since 3 and 4 am people are already leaving work and coming back at 10 or 11 pm. What time can they spend with their kids. the kids are growing with no time with their parents, some are growing fatherless motherless. This needs to change.

PANGUILA SECTOR 10

Female

Renter

Domestic



FIGURE 168 NEIGHBORHOOD IN PANGUILA SECTOR 10

Q

Are you the owner of the house?

A

No. I am renting.

Q

How long have you lived here?

A

Four months

Q

Before you came to live here where did you live prior?

A

At Petrangol, Luanda.

Q

How is the interaction between you and your neighbors?

A

I get along well with my neighbors; I have no problems with anyone.

Q

What would you like to be added to this neighborhood?

A

First thing is that we don't have schools. We don't have a hospital nearby, no electricity, and there are lots of bandits.

Q

Do you share the house with anyone else? How many people live with you?

A

I have three children. I do not have a husband

Q

Do you run a business?

A

I am a domestic. I have worked as a housekeeper for 8 years.

Q

Where do you work?

A

Here in sector 10.

Q

Do you feel that something has changed in your life for better or for worse and what would you like to see changed?

A

Here it is very complicated. In my case I like to stay in a quiet place, but the thing that worries me is that I have a 15-year-old girl not in school who has no way to study. My younger children now live with a boss I worked for in Sequel. This way they could attend school. I live alone, me and the father are separated

Q

Do you have any questions to ask me?

A

As soon as I saw you, I was afraid. I thought we were going to start receiving people who will interrogate us. Something like that is complicated. But now I know everything is fine.

PANGUILA: SECTOR 11

Male

Renter

Taxi Driver



FIGURE 169 NEIGHBORHOOD IN PANGUILA SECTOR 11

Q

How long have you lived here for?

A

I've been here for a year and almost two years, first I was living in *Sambizanga*.

(*Sambizanga* is a neighborhood in Luanda),

Q

Do you know your neighbors well? Do you feel as though you are part of a community?

A

I know my neighbors well. We are always together and thank God nothing happens to them. The most important thing here is our bond.

Q

What do you have in terms of services?

A

Our problem is that we don't have electricity, but we have fountains for water that were provided to us.

Q

What do you have in terms of amenities?

A

We here in this area of Panguila Sector 11 do not have a medical clinic. We don't have a hospital, we only have a small school, which is here in front. It's called Zamarel. In all of Panguila we only have one big hospital called *Brazileiros*. (Brazileiros is a public hospital). To get out of here is complicated, you have to go by motorcycle. If anything happens at night, we have to go on foot. Taking children on foot there is complicated, from here to Brazileiros is so far, we would like to have a good school here and hospital. We have a school, but we need more schools, hospitals and need electricity.

Q

What do you do for entertainment?

A

In this area we don't have places for entertainment. Fun here is complicated. We only have one Panguila market and one in Caxito nearby.

Q

How big is your family?

A

We are a family of 6. I am a father of four children all of whom are home right now.

Q

How have things changed since moving here?

A

I feel that since I came here everything has gotten worse. The worst thing is that I live in a rented house. I pay rent and I'm not working. I just depend on the money I make as a taxi driver. I have no other business. I worked at the SONIL base, at LPF but the contract ended. When I left LPF I no longer had a job and came here, my brother had a few cars, so I joined as a taxi driver and I'm still looking for a job.

PANGUILA: SCHOOL (MODULAR PROJECT)

Male

School Director

Teacher



FIGURE 170 SCHOOL COURTYARD IN PANGUILA

Q

What do you suggest could be done to help the school?

A

2019 was a good year. We managed to minimize some difficulties for this academic term. Our main concern is to create more classrooms, to try to build a multipurpose field and to facilitate physical education classes. Our administrative area needs materials to carry out work, markers, office supplies, and chairs for the teachers' room. The conditions in the teacher's rooms are not satisfactory because they do not have the minimum conditions to work.

We also would like to have piped water but unfortunately, we do not have it. We would like to have a water treatment system to purify the water. We can take care of our garden, although it is quite small. If we had water it would be better because our intention is to increase its size.

At this point we are looking for 120 tables because we have chairs, but we do not have desks. The other needs are bigger such as the issue of security. The issue fundamentally is that the size of the school is too small.

Today we are in the process of working on correcting the number of students per class. We have more than 50 students per class but at this moment we are working with groups of 30 to 35 students. Student attendance is decreasing, and this decrease is more apparent for children who are 5 or 6 years old. The Modular project is the only school we have, but if we could increase the number of classrooms, we can have a larger number of students and better accommodate the sectors surrounding the Modular project. We have students from all over Panguila and outside of Panguila. We have students from sectors 1 to 11, but the school only has 15 classrooms.

Q

What are the other difficulties encountered inside the classrooms?

A

I almost stopped myself from going to this issue, maybe I felt it was not necessary, but we are in an area of accentuation. Here the Modular project received residents from almost all areas that were intervened by the state in Luanda. Here in the Modular project there are people who came from Rangel, Sambizanga, Cacuaco,

and downtown. Many of these people have many difficulties. There are times when we receive students that have not bathed or had breakfast. These are difficulties that we often must manage internally. For example, there was a time when we noticed that a boy was really hungry, and the teachers gave 50 kwanzas and whatever they could. We went to the canteen to buy something to satisfy the boy's needs. Sometimes a soup is all we can supply. We have had many situations of this kind. There are times when the boy cannot come to school. When the teacher visits and asks the mother why the boy is missing during classes, the mother replies that the boy didn't go to school because he spent a day without dinner and today, he can't get up. There are many social difficulties that the residents of the Modular project must face.

Q

Is this school of the state or private?

A

Our school is state-owned, unfortunately it has not yet been recreated. It has a decree of creation but as a territory of Luanda today. Since Panguila is now a territory of Bengo, that decree of Luanda no longer agrees with the current reality, since the two decrees cannot be achieved. But it is state-owned, built of blocks, and it works in three periods, morning, afternoon, and night, with more than 1500 students. Last year we worked with 1989. Maybe this year we can work with the same number or decrease a little because we are in a correction process. We do not want more classes with 60 students. We are fighting so that 90% of the classes have 40 students and the other 10% work with 60 or less students.

Q

How are the materials distributed to the school, or do the parents have to fight to get these materials?

A

Unfortunately, we have not received any material for three years, so each one, according to their difficulties, strives for their own educational material.

Q

And how does the school work with pupils who cannot afford to buy materials?

A

We work according to the conditions we have; teachers try to accommodate students whenever they send an activity. But one cannot share what he does not have.

PANGUILA: SCHOOL (SECTOR 11)

Male and Female

School Staff

Teachers



FIGURE 171 SCHOOL IN PANGUILA SECTOR 11

Q

Could you first talk about this project? Why did you build this school?

A

First of all, the school is a by-product of the community. It was built because we saw that here in sector 11 many children were out of school due to the lack of documentation. There are children who were getting left behind because they did not have a ballot. The project aims to help undocumented children study.

Q

Who led this project?

A

The project director is Sr. José André António. He is the owner and general director of the school.

Q

How many children study at this school?

A

We have 206 children in this school.

Q

What classes do you have here?

A

We have from initiation to the sixth grade.

Q

What are the biggest difficulties you have encountered here?

A

Most children have no documentation.

Q

Are you a teacher? If so, as a teacher, what are some difficulties you have encountered?

A

The difficulties we encounter here is that there are many children out of school. They come here without didactic material and they come with dirty, dishevelled hair, without a smock or with a dirty smock. These are the difficulties I encounter but in terms of teaching the students are excellent. What we want is to do our best to help the children have a snack because there are children who leave home and come here crying, "Teacher I didn't eat anything I'm hungry, I want to eat." It helps if the teacher has something to give to these children. These are the difficulties and many other difficulties that we encounter. We only ask you to support us.

Q

Do you work here too?

A

Yes, I am the man of the technical area.

Q

There are 206 children here. How are these students divided into each class? How many students can a class have?

A

It depends on the class. In the sixth grade class there are three students, the pre-school class has 30 students, the first grade class has 62 students and the fifth grade has 10 students, the second grade class has 32 students, the fourth grade class has 17 students. This year we expect to increase student numbers because

there has been a lot of demand. This year it could probably reach 400 enrolments, because there is more enrolment than confirmations.

Q

What is the capacity of each classroom?

A

20 people

Q

How many classes do you have?

A

There are classes in the morning and in the afternoon, and we also want to add literacy classes in the evening. But we have difficulty with lighting because we have no energy.

Q

We see that the school is made of sheet metal. What happens when it rains or when there are strong winds? How do you manage to upkeep the school?

A

As you can see, we have a room here. After a few days there was a strong wind and the plate moved out of place. This is just one of the difficulties that we must face.

Q

In other words, after a windstorm you take the plate and put it up again?

A

Yes, that is what happens. We also have supply problems. We must ask caregivers to bring a stool so that their children are seated. Once again, we have a lot of difficulties. We have this room not fully covered because we do not have enough sheet metal.

Q

Are there any remuneration issues for the teachers who work here?

A

We depend on help from the community. This is a problem because not all guardians can participate. Last year we worked with 206 students but only 20 guardians participated. The director and owner of the school José André António made sacrifices to remunerate the teachers.

Q

Thank you for the answers!

A

We are the ones who are grateful. We are grateful to have you come here and hope you come back. There are many children out of school and some parents try to pay their contribution but those who are at home and have no job, have no way of helping. We have children that have parents who cannot contribute.

APPENDIX II

CAPARI

Female Resident

Unemployed



FIGURE 172 NEIGHBORHOOD IN CAPARI

Q

Where did you live prior to Capari?

A

I used to live around the waterfront where I rented an apartment with my husband.

Q

Is it more expensive to live around the waterfront?

A

Yes

Q

Why did you choose to move to Capari?

A

We moved to Capari because it gave us an opportunity to own a house. I rent it right now but at the end it will be our own house.

Q

How many people do you live with? Do you sub lease any rooms?

A

We are a family of four. Me, my husband, and my two children. We do not sub lease.

Q

Are you employed?

A

I don't have a traditional 9 to 5 job, but I do have my own small business. I sell Jewelry. My husband works in Viana.

Q

How often does your husband work?

A

He would commute to work 6 days a week. Monday to Saturday. Saturday is usually a half day.

Q

How long is your husband's commute to work?

A

It is an hour and half to Viana. Although that is because he has to get to the other side of the city

Q

Where do you go for amenities?

A

The closest store is the superstores in Cacuaco. There is a Shoprite and a Maxi there. If the markets don't have what I need I go a bit further to the *Caro* (supermarket).

Q

What do you enjoy most about living in Capari?

A

The positive side is that it's very calm and we don't have many problems with security or electricity here. The negatives are the distance to the center of town. Water is also a Significant issue. Water is in the pipes early in the morning for about two three hours. In the evening we have it again for another 1-2 hours. Also, there aren't any close amenities around here, nor is there space that would allow people to start a small business.

Q

Do you feel like you belong to community? Do you have friends that are entrepreneurs as well?

A

You find due to the lack of services here that a lot of people have small businesses. Some sell drinks or food and some offer other services to fix things.

David Castello - *It is important to note that Angolans by their very nature are entrepreneurial. To survive in a place like this you have to be savvy. Here in Angola we say your income and your salary are very different things. Even people with 9-5 jobs have a side hustle for extra income.*

Q

Do you feel like you belong to a community? Do you know your neighbors well? Are you making new connections here?

A

No but my husband is more social than I am. I am more reserved and even with the neighbors here it's more about the relationships we form through our children.

Q

Do you feel you would benefit from a community center or co-working space? Are there any other amenities that you wish would come here?

A

Yes, one of the biggest complaints is that there aren't community spaces where people can do business. You see people who do a bit of business, but they end up having to be in the street. Because there isn't space here people have to go very far away. But ideally you want to start business in your community. Even the nearest hospital is quite a far drive away and most people don't have a car. There are a few neighborhood clinics, but they aren't usually credible. The nearest hospital is 15 km away. Recently a girl died here, and it was preventable, but the nearest hospital is in Barra do Dande.

David Castello - *it is worthwhile to build a space reserved for specific services where a private sector can be placed. Hospitals and School spaces are very important.*

A non-descript space with no divisions would work well. A school could be given a bit more structure. Often the Biggest complaints for housing projects tends to be that there is no hospital, no school. They have to commute a long time already.

Q

What do you have in terms of schools?

A

We do have a school here though that goes to the end of primary. By law kids must go to school till 16. Once the child is of age, they have to go find a secondary school. In Capari schools go a bit later until the 9th year. Schools in surrounding neighborhoods often go up to the 7th year. These students often come to school in Capari. After the 9th year students usually go to school in Caxito. There is one school. A private school that goes to the final year, that is nearby, but it is unaffordable to most of the people who live here. The school would likely service the higher earners in Capari.

Q

How far is Caxito?

A

It's a 25-minute drive.

Q

Are there any playgrounds in your neighborhoods?

A

Yes

Q

Are there any bars or places for entertainment?

A

There are no spaces for business so there are no bars. But there are some people who sell alcohol from their house. Any night life is a bit of a distance and those neighborhoods may not be as welcome to outsiders. There is monotony here in Capari. When my brother came to visit, he liked it because it is nice and calm but for us living here the distance of things is a problem and can make things very boring.

David Castello - *In the neighborhood I live in people know me so it is easier to go to certain places but if you're from another neighborhood there could be trouble. Also, the men in Angola usually go into the city for nightlife. Often the men live carefree while the wife looks after the family.*

Q

What do you do in terms of transportation from Capari into the city?

A

Public transport is not as convenient in a developed country. Even catching a taxi is hard as you may need to make multiple stops and take multiple taxi transfers. In terms of transportation to the city, I sometimes might end up waiting two to three hours. Even then, the taxi that arrives might be full. This is tough especially when you are waiting with the kids.

Q

Are there any buses or transit in Capari?

A

The yellow buses don't pass regularly. A lot of these don't have a real schedule. One may come at 3pm one day and 5pm the next so any planning is not possible.

Here there is a neighbor who does a bus at 6:30 am and at 7 am. For specific people that's helpful but for others who have errands it is not helpful.

David Castello - *For Panguila, yes you can say there is a public service, but it may not be reliable or regular.*

Q

Are there any car sharing applications?

A

David Castello - *There is one, but it would be very expensive to go from here to the city. Anyone who uses it regularly would need a lot of money. I would only use it for a short distance. It can cost me about 8 thousand Kz (20\$)*

The Combinda app is the cheaper one where you have options for normal, economic value and VIP. You also can contact moto taxi with the apps, but you wouldn't be able to get one from a town to here due to the danger of the main roads.

David Castello – *One of the most significant costs for people in Luanda is transport. Public transport isn't that great, so you have to use private public transport. The private does it according to profits so the routes are specific. You will get dropped off at different places. Your average person might take two taxis to get somewhere. If you're working that's 4 taxis a day. In context of Capari to the city for example (Capari to Sao Paolo to Mutamba in the city), you get the first taxi at*

the end of Capari to get to Cacuaco, just before the Bengo sign. That would be about 250 Kz. Then from there you would take another taxi that would get you to the center. Another 250Kz. Then from there you catch another to go to wherever you need to go. It might be 150Kz. In total it would be about 650 Kz. About over a dollar. But you see a dollar is quite a lot of money. Then back and forth means that the person is paying 13000Kz a day. The average salary in the formal sector is about 20 000 – 40 000 USD. Over 22 working days of travel can be more than the salary of some. Transportation costs here are very expensive, especially when you factor in the cost of moving goods and amenities.

Q

What is the typical population demographic here?

A

David Castello -This would be lower middle class. But you see most of Angola is poor. After that is lower middle class which is maybe around 8% of the population. Even though these centralities were made for the lower middle class, in reality the costs are not for their demographic. Quite often when they do the calculation, they don't factor in travel to the centralities. Here they pay 27 000 USD but at Kilamba it is 40 000 USD. One of the problems of payment is that the people who are living here don't have the ability to pay. In addition, transport factors added to the cost makes it more than the rent of Kilamba.

APPENDIX III

VILA FLOR I

Male

Homeowner



FIGURE 173 NEIGHBORHOOD IN VILA FLOR

Q

Can you tell us about the nature of the housing? For example, how the plots are distributed?

A

This isn't a state project. And it's also not like one private person owns everything.

You'll find that some people own a certain part. And if they have a bigger part, they will break it into plots and sell it off. Someone just sold me a plot here.

I bought a plot with the basic asset. I did all the finishing, the doors, the windows, and all the other additional changes.

At this moment, there actually isn't a public grid here. So, what you're seeing

here with these posts is people illegally taking off the grid to put it themselves because the state hasn't brought it in. The electricity line is on the main point, but it hasn't gone in. What I hear from the local administration is that the state does have a plan to bring in electricity.

Q

So, all these houses are private?

A

They are private purchase so you will find some cases where the person just sells a plot. Other cases where the person, or the constructor of the company, sells the plot with a basic house. As people start adding their finishes other neighbors will also start doing the same and at times copying the finishes that they see around them.

A

Initially the front of the houses will all be upon purchase so that there aren't several random aesthetics. In practice, a lot of people then decide to do whatever they want and it's really hard to supervise the creative changes.

Q

Do you live here? Is this a plot you own or are selling?

A

I do not live here. This is my house, but I am still doing the finishing touches before I move in. One of the last things I will need to do is bring electricity here before I move in.

Q

Why did you choose to move here?

A

The first reason was location and access. Even though there's no running water and electricity at this moment, there is running water and electricity public lines around that will hopefully eventually be brought in. There is also the main road that can be accessed here. There is also the industrial area. Choice is also limited at a roughly decent price.

Q

How long is the commute to work?

A

I work ten kilometers from here.

Q

Are there any amenities nearby?

A

There are already the pre-existing big supermarkets, and there is a Kero not too far from here and a Maxi on the main road. But inside the actual project there still hasn't been those small services like the convenience stores. They're still developing because again those things tend to appear as people start moving in.

This originally would have been agricultural land.

Q

Would you be open to selling parts or buying more houses here? Is it usually an option to partition your space to rent it out to make extra money?

A

I don't know. There are indications that this is happening. There is also a difference between what is supposedly not allowed and what people end up doing. First, I purchased the house and then afterwards I went and got it licensed. I had to go to the local administration and then their technical people came on site. After that everybody had to license their plot individually.

Q

In terms of the future is there anything that you would like to see being built, such as a hospital or a community center?

A

In terms of services I would like to see nearly everything. It is worth pointing out that the reality in Angola is that more often than not, if it is a state project then this is how it starts; you sell and then the state starts bringing in electricity and water and eventually the services. This may take time because of the election year. Closer to the election infrastructure starts being brought in.

Q

Thank you for taking the time to answer my questions. Do you have any final thoughts or questions for me?

A

There are mostly women here. For example, if there had been a lot of men here it would be kind of risky to film them because there's a lot of pieces of land that are

in dispute here; because we have a big problem here in Angola where different entities of the state emit the same documents for one person. So, you must be careful when you're filming here because there is a lot of men that may come and ask questions thinking that you are filming because of the disputes about the land. I myself have had a bit of an issue with somebody claiming that this was their land too. This problem occurs nationally, even in state projects. In Kilamba there has also been an issue where somebody signs a contract and enters their house and finds somebody else inside. That other person that they find inside shows them that they have a contract for that property as well.

Q

That's very bad. Does this also happen from the official offices?

A

Corruption is endemic here; it's literally top to bottom at every level. So, you do get a lot of situations where multiple documents have been issued for multiple things. Even in the centralities you get a few disputes because two people have been allocated the same house not by mistake. Usually with those kinds of cases, one of those people clearly went through the illegal route of trying to pay, but they've gotten legal documents. In a lot of other cases, the person is not even aware that the public servant or staff member is doing that. Because this is the thing; if you're in the institution's head office, if you're with the public servant that normally gives out the documents, and you sign; how are you supposed to know that the public servant is doing a dodgy thing? You only find out the day you go into your house and find that somebody else is living there. That's the problem!

VILA FLOR II

Female and Male

Homeowner, Renter

Landlord, Laborer



FIGURE 174 NEIGHBORHOOD IN VILA FLOR

Male:

Q

How long have you lived here for?

A

Three months. I am renting this plot.

Q

How many families live here? How many people are renting?

A

Three families. The owner of the land lives in one of the houses.

Q

Are you renting to be closer to school? Why did you choose this location?

A

I moved here because of work. All along the main road is an industrial area. I moved here to be closer to the work opportunities.

Q

Where did you move from?

A

I was in the Bié province before coming here.

Q

Do you like the area? And if so, what do you like about it?

A

Positive things about the area has to do with the work. There are a lot of work opportunities here especially with trade work. On the negative side the major problem is security. That is a general thing. Anywhere with no public lighting you have that issue. Security would still be a big issue. I need to be home by 7 o'clock the latest. There used to be routes on the way here, but they are blocked off now. This helps robbers because the dwellers only have one route to get back, so the robbers just wait at the end of that route. The chances of being robbed are high.

Q

The overall issues are with regards to electricity, infrastructure, and security?

David Castello - *You may have all the other things you need but the problem is electricity is linked to security because electricity is linked to public lighting. Anywhere in the world, one of the biggest worries for someone choosing where to live is security. You could have the best house in the world but if you live in a place where you get robbed every time you try to get home it's just not worth it.*

Female:

Q

Do you have a small business? Do you sell things on the side to make extra money?

A

I sell gasoline along the road. There is a canteen nearby, but it sells a limited range of things.

Q

What upgrades do you want to make?

A

I am the owner of a one bedroom. I would like to ideally do more but all the income I get from selling gasoline goes to the school fees for my children.

Q

How do you feel about living here?

A

We feel very abandoned by the state here. If there is someone that is wealthy, they might pay the state to bring something, but the state doesn't come here. It doesn't exist here. There was no recourse when a man came and occupied space and pushed us out.

Q

Do you have any final thoughts or questions for me?

A

I feel a sense of hopelessness. As soon as it gets dark you need to be in your own house, and you cannot even go out because there is so much fear. The environment is so hostile that you just try to survive. If you manage to get a little space, you just stay in your house and try to pray for something that is probably not going to come. This is the first time that someone from outside has come to ask us how we are living. We have never been asked that by anybody. The nearest school is not too far away in theory but other people with more money occupy and block everything. Our kids must walk all the way around just to get to school.

Male

Q

The only people helping us out somewhat are the Chinese through some odd jobs and even then, it's hard labor for little pay. You may consider it help but you're exploited in that situation. There aren't many other opportunities and from this lack of options, you end up in a situation where you are thankful even though you're being exploited.

KEY TERMS

Single Loaded Corridor: A single loaded corridor runs along an external (or atrium) face of the building. The associated dwellings are accessed off one side only and may be on one or more levels if the corridor access occurs on alternate levels.

Stacked Towns: Stacked townhouses share a sidewall like traditional towns but are also stacked vertically with 2 or 3 units on top of each other, and they have both a front and a back.

Musseques: Musseque mean sandy arable red land while it's plural often refers to the informal settlements in Angola, mostly associated with the sprawling slums around the capital, Luanda.

Slum: A simple definition of a slum would be “a heavily populated urban area characterised by substandard housing and squalor”. (UN-HABITANT)

Centralidades: New towns

Microfinance: The micro finance model is a type of banking service that provides low risk micro loans to enable the low-income recipients to build social capital.

Kixikali: Angolan name for collective form of peer to peer banking and lending is formally called (ROSCA)

ROSCA: A rotating savings and credit association (ROSCA) is a group of individuals who agree to meet for a defined period in order to save and borrow together, a form of combined peer-to-peer banking and peer-to-peer lending.

Self help Housing: Self-Help Housing involves groups of local people bringing back into use empty properties. It differs from “self-build housing”, which involves constructing permanent homes from scratch.

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