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MUKURU STUDIO
INCLUSIVE UPGRADING FRAMEWORKS FOR NAIROBI

**KOMESHA
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Suit Coat

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Shack/Slum Dwellers International (SDI) and Strathmore University
August 2014

Why This Report

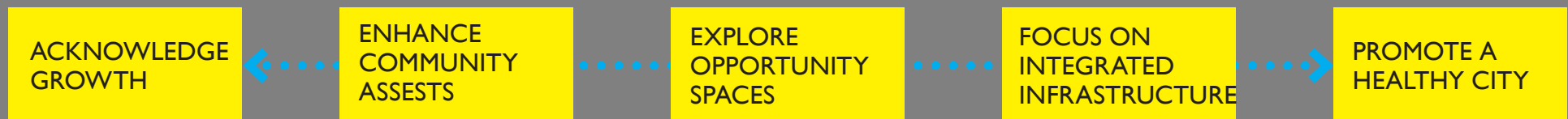
This report reflects the work of a team of students from the University of California, Berkeley, University of Nairobi, Kenya civil society organizations, including Muungano and Akiba Mashinani Trust (AMT) and residents of the Mukuru informal settlement in Nairobi, Kenya. The aims were to offer a vision for a more inclusive, equitable and just city where slum dwellers and their place of residence and labor are valued. The report seeks to offer an alternative but also complement recent plans for the City of Nairobi that do not appear to be as inclusive of slum dwellers as possible, such as the Nairobi Master Plan and Nairobi Vision 2030. The report is organized around five themes or principles that were expressed to us from Mukuru residents and civil society organisations in our planning process, including: acknowledging growth of informal settlements; enhancing existing community assets; exploring new spaces in the community for development; integrating the delivery of basic infrastructure such as roads, water, sewer, electricity and others, and; promoting a more healthy, equitable, and just city. These principles help organize the content of this report. In the first section, we summarize the key characteristics of Mukuru. While other reports and studies have offered more details about Mukuru, we aim to highlight the key issues and opportunities residents of Mukuru face for greater inclusion into the fabric of the region and Nairobi. The second section of the report reviews the proposed plans for Nairobi and how well they include the city's informal settlements. In the third section, we return to Mukuru and analyze specific challenges the settlement faces for inclusion into the region and city, using our 5 principles to organize the presentation of data and analyses. Section 4 offers proposals for upgrading that aim to integrate Mukuru to the surrounding region and Nairobi. Finally, section 5 offers a detailed upgrading proposal for one village in Mukuru, called Sisal, to highlight the challenges of financing and land use planning that future upgrading may encounter. We hope this report helps further the on-going urban planning and policy work in Nairobi and supports slum dwellers in Mukuru and elsewhere to achieve more equitable, safe, and healthy communities and livelihoods.



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Our Approach to the Inclusive & Equitable City



The Project's Model of Change & Outcomes: Greater Justice for Slum Dwellers

A COLLABORATION BETWEEN:

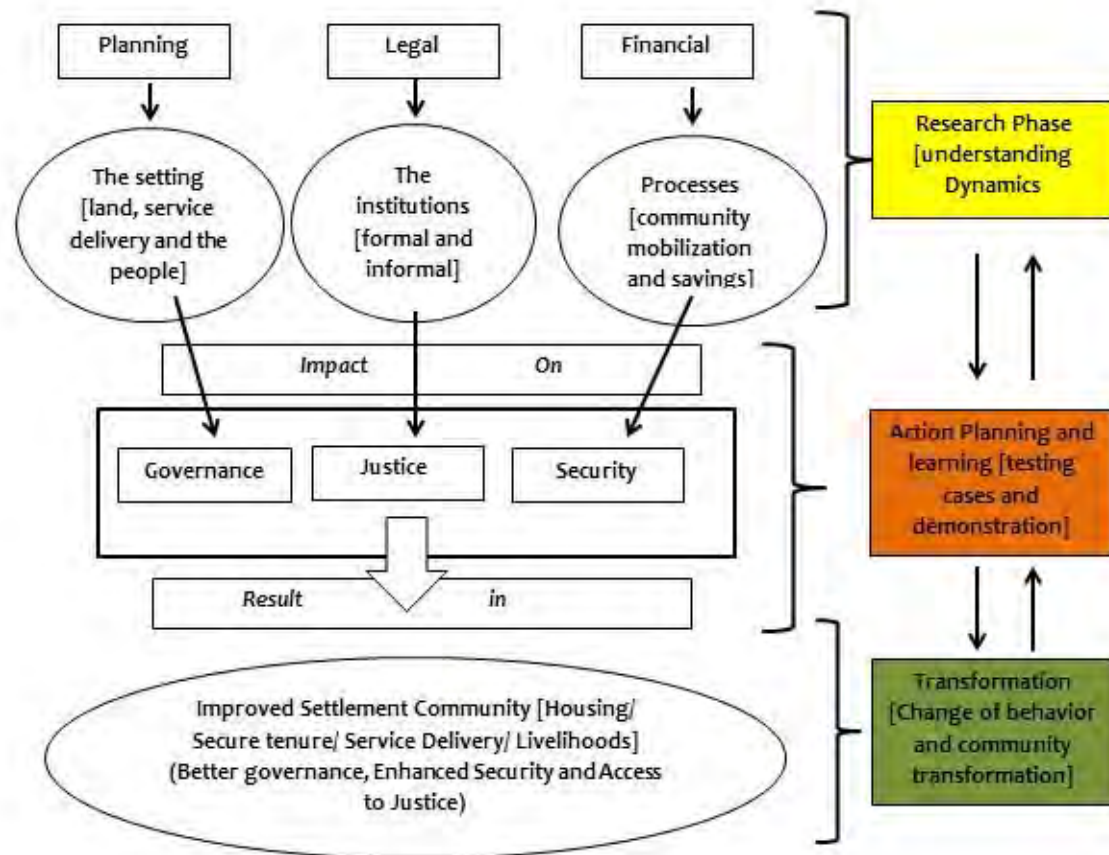
University of California, Berkeley.
Department of City & Regional Planning
and Center for Global Healthy Cities, www.healthycities.berkeley.edu

Akiba Mashinani Trust: the housing development & finance agency by the Slum Dwellers Federation of Kenya - Muungano wa Wanavijiji (MWW), an affiliate of Slum Dwellers International (SDI)

Muungano wa Wanavijiji - federation of Kenyan Slum Dwellers

University of Nairobi, Department of Urban & Regional Planning. Center for Urban Research & Innovations. <http://www.centreforurbaninnovations.com>

Shack/Slum Dwellers International (SDI): a network of community-based organizations of the urban poor in 33 countries in Africa, Asia, and Latin America.



WHY MUKURU?

Mukuru Kwa Njenga and Mukuru Kwa Rueben together form the third largest informal settlement in Nairobi. Mukuru faces similar challenges to many informal settlements: extreme overcrowding, inadequate sanitation and water services, and a constant threat of eviction due to insecure land tenure. Yet despite its challenges, the community is vibrant, home to a multitude of local businesses and community institutions. Additionally, it has recently been the site of several newsworthy events that have sparked greater community organizing and advocacy efforts on behalf of all those living in informal settlements across Nairobi.

The first of these events began in 2004, when the Kenya Railways Corporation (KRC) attempted to reclaim rail right-of-way which had been encroached on by residents of Mukuru and Kibera. KRC hired Pamoja Trust to conduct a participatory resettlement study and Relocation Action Plan (RAP), which outlines a fair and justly compensated relocation for the more than 10,000 affected persons.

Perhaps the most startling catalyst occurred in September 2011, when a tragic oil spill led to a fire in the Mukuru Sinai neighborhood, claiming 120 casualties and destroying hundreds

of homes and property. The residents' encroachment on the petroleum pipeline was cited as a major cause for the fire, and poor road access and a lack of clean and unpolluted river water prevented rescue workers from properly addressing the situation.

In 2012, violent, unexpected evictions by private land owners and developers left several dead and an estimated 100,000 residents displaced.

Today, these troubling events have become the impetus for community mobilization, sparking massive transformations for Mukuru in the areas of sanitation, health, land security, and community development. Mukuru Sinai residents have organized with the help of Pamoja Trust and Akiba Mashinani Trust to buy 23 acres of land in Mukuru to upgrade and build fire resistant structures. As of 2012, the private sanitation company Sanergy had installed 150 pay-per-use toilets in Mukuru. Local NGO, Umande Trust, has also been actively expanding the adoption of community-managed BioCenters. Lastly, construction began in 2014 on a new sewer line in Mukuru with the help of Pamoja Trust.

These events are driving forces of community change and provide a basis for this report.



MUKURU SUMMARY



HISTORY OF MUKURU

The community of Mukuru dates back to the colonial period when a white settler named Reuben used the area for commercial ranching and sisal farming [3]. The settlement was started by one of Reuben's farm hands, Munyai, and developed as an informal labor camp for the farm's workers. Mukuru Kwa Njenga was named after an original squatter known as Mzee Njenga who worked for Reuben while Kwa Rueben was named after the white settler.

At independence in 1963, the government compulsorily acquired land for public use especially at the city fringe including Mukuru [4]. In the 1970s and 80s the land was alienated, subdivided and allocated to well-connected wealthy individuals to develop industrial buildings in return for political favors[5]. New owners were expected to develop the land within two years; failure to do so would result in repossession by the government. The majority of allottees were unable to develop and sold the land to companies or used the parcels as collateral to acquire bank loans, leaving the area vacant.

At the same time, the area continued to grow as an informal settlement due to the pressure of rural-urban migration. The location of Mukuru

next to the industrial zones attracted industrial casual workers, and new arrivals acquired land from provincial chiefs at a small fee.

To date, the residents of Mukuru do not have legal claim to the land they reside on due to the informal nature of land allocation and squatting. This lack of land tenure is an impediment to service provision for residents, and also has resulted in frequent eviction threats.

However, according to Kenyan laws, the people of Mukuru have lived in their respective villages long enough to warrant land tenure security. The constitution states that once someone has squatted on a piece of uncontested land for a continuous period of 12 years, the state should declare that person the bona fide owner. With regard to squatters, Article 160 (e) of the Kenya Land Act gives the Land Commission the powers to: facilitate negotiation between private owners and squatters in cases of squatter settlements found on private land; transfer unutilized land and land belonging to absentee land owners to squatters; and facilitate the regularization of existing squatter settlements found on public and community land for purposes of upgrading or development.

Kenyan Timeline

- Early 1900s - British settlers move to highlands
- 1963 - Independence
- Post-Independence - Land at fringe of Nairobi allocated to wealthy individuals
- 1978 - Moi era begins
- 2002 - Kibaki takes office
- 2007 - Disputed elections lead to violence
- 2010 - Kenya adopts new Constitution

Mukuru Timeline

- Early 1900s - White settler named Reuben acquires area
- Post-Independence - Mukuru land subdivided to well connected Kenyans
- 1970s - Area grows as informal settlement
- 2004 - Kenya Railways begins Railway Relocation Action Plan
- 2011 - Mukuru Sinai fire leaves 120 dead and hundreds displaced

DATA ON MUKURU

Mukuru's Villages

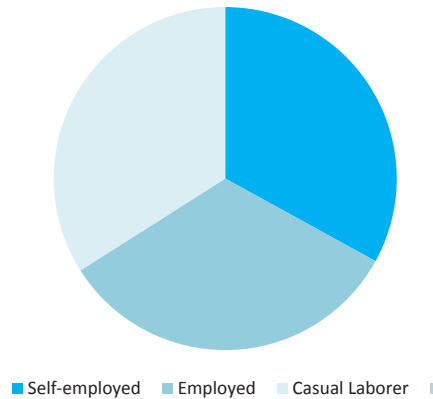
Mukuru Kwa Njenga is subdivided into 8 villages: Sisal, Milimani, Vietnam, Riara, Moto Moto, Wape Wape, Zone 48 and MCC. The estimated population from the 2009 KNBS census is 66,505, though the 2009 MuST enumeration suggests the figure to be closer to 136,000.

Mukuru Kwa Rueben consist of 16 villages: Gatope, Railway, Diamond, Wesinya, Mombasa, Jamaica, Lunga Lunga, Sanai, Reuben Kijiji Mpya, Paradise, Feed the Children, Rurie, Bins, Simba Cool, Kosovo, and Falcon. The census estimates it to have a population of 44,000, though the MuST enumeration estimates it to house 129,000.

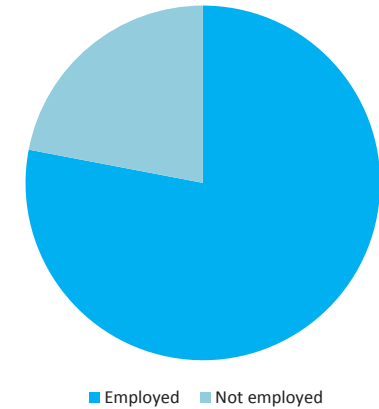
Each village name embodies the history and experiences of its residents. For example, Riara, which started in the 1990's to accommodate overflows from Vietnam and Sisal, was initially covered with thorny plants known as riara. Both Vietnam and Kosovo derive their names from eviction wars between residents and GSU Officials. The confrontations were likened to the Vietnam and Kosovo Wars. Village 48 is named after the estimated number tribes represented in the village[2]. Other villages such as Railway, Feed the Children, and Falcon are named after adjacent industries and companies.



Mukuru Kwa Reuben
Types of Employment, 2012



Mukuru Kwa Reuben
Total Employment, 2012



Population and Housing

Mukuru is a dense settlement that faces significant challenges related to overcrowding. Kwa Reuben has an average of 3.77 individuals per household, with a vast majority of households living in 10x10 meter tin structures [1]. This overcrowding generates severe health risks for the community. The typical layout of a structure in Mukuru Kwa Njenga is two rows of five to twelve rooms separated by a footpath which is used as a space for laundry, cooking, and access. The household density of Mukuru kwa Njenga is 2.5 households per 100 square meters as per the census data and 4.1 households as per the MUST enumeration data [7].

Transportation & Connectivity

The main entry points into Mukuru are via Mombasa road and North Airport road from the South (MCC and Moto Moto), and Outering road from the north (Sisal). The residents also use small informal footpaths along the railway to access the industrial area [7]. Within the settlement walking is the predominant mode of travel.

The settlement includes primary, secondary, and tertiary roads, as well as footpaths. The dimensions for these roads are 15 m, 9 m, 6

m, and 1 to 2 m, respectively. Larger roads are commonly lined with local businesses and are vibrant economic centers for the community. The smaller roads and footpaths serve individual homes, and often have poor drainage making them impassable during the rainy season [1]. None of the roads in the community are paved.

Businesses

Mukuru residents are typically either employed in the industrial area or run their own small businesses. A University of Nairobi survey of Mukuru Kwa Njenga found that at least 80% of the people interviewed work within the settlement whereas 21% of the people work outside of Mukuru [8]. Economic hubs in and around Mukuru include: the main street of Wape Wape; land adjacent to the rail line in Sisal and Wesinya; the main entrance into Mukuru kwa Reuben; and Falcon Road [6]. The settlement hosts a great diversity of business, including grocery and charcoal vendors, hotels, barbershops and salons, bars and restaurants, and a wide variety of small kiosks and shops [7].

Despite lively and diverse informal commercial areas, residents still face many economic barriers and local businesses face many challenges, such as high competition from similar businesses,

power blackouts, high numbers of debtors, and eviction threats [8]. Over fifty percent of residents who run businesses started with personal savings. Very few residents got starting capital through loans via micro finance and savings groups. Daily income averages are difficult to estimate, however, 18.6% of the people interviewed earn between 151-300 Kenya Shillings per day [7].

Schools

There are several education facilities in Mukuru kwa Reuben, most privately owned and operated. The vast majority are primary schools and kindergartens with only one secondary school and two tertiary schools. Mukuru Kwa Njenga also has numerous primary schools, but only two secondary schools. School size ranges from 20 to over 300 pupils with the exception of Kwa Njenga Primary School which has over 1,000 students [7]. Over 85% of the facilities are located in rented spaces that were initially residential rooms, with an average rent per room of Sh.1,500 per month. Fees for students range between Sh. 300 – Sh. 500 per month. The teachers for such schools are often inadequate in number and under-qualified for the job, with salaries ranges from Sh. 3,000- Sh. 7,000 per month. [7].

DATA ON MUKURU

Expenses

Average household costs in Mukuru kwa Njenga are 7,118 KSHS per month for an household of 3.1 people (AMT, 2012). This expenditure includes rent, food, health cost, water purchase, toilet usage, and transportation

Electricity

According to the AMT 2013 profile of Mukuru, the majority of residents are connected to electricity. However, the most common method of connection to electricity is illegal, connected through the “sambaza” method where residents tap electricity directly from existing lines. Only 5% of Mukuru residents have legal connection to electricity, 75% are connected via “sambaza”, and the remaining 20% live without electricity.

Community Spaces and Open Areas

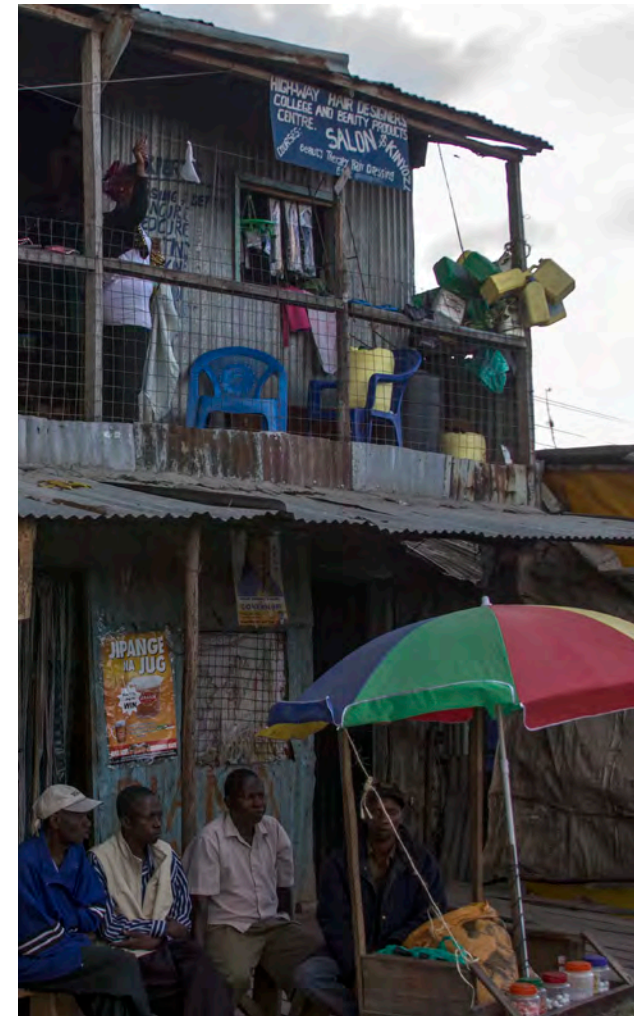
There is a shortage of community facilities in Mukuru Kwa Njenga. Most of the functions and meetings in the area are held in open spaces, churches, homes and on the street [7]. Open spaces in the settlement are typically associated with social facilities, particularly education and serve a multitude of recreational functions. Streets serve as multi-functional spaces for business, socializing, and play. In Mukuru

kwa Reuben, most of the open spaces are concentrated in Rurie Village, one of them being a playground for youth in the area [6].

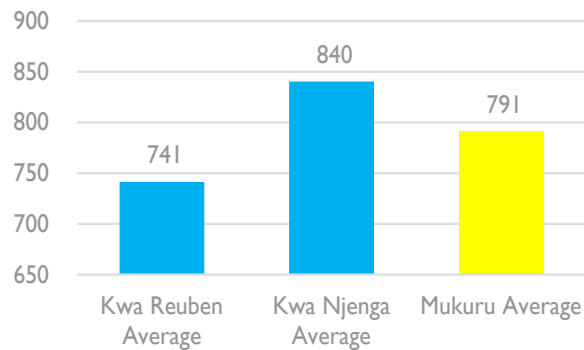
The main open spaces include: Vision ground/ Greenfields; School compounds e.g. Kwa Njenga Primary School, Our Lady of Nazareth Primary School, Chaminade Training Centre, Embakasi Girls; Pipeline; Villa Police Post; Streets; and un-built plots [7].

Health centers

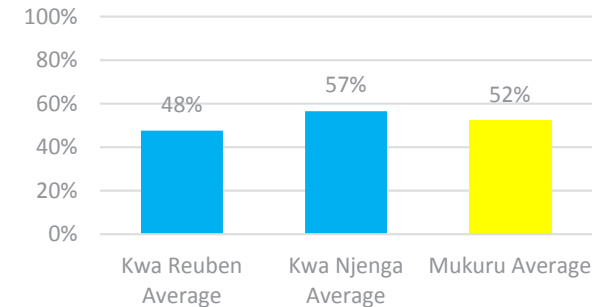
Mukuru has both formal and informal health services, with the most common facilities being chemists and clinics. The two main formal facilities within Kwa Reuben are Medical Missionary of Mary Church and Alice Nursing home. The main health facility within Mukuru Kwa Reuben is the Reuben Centre clinic, which serves about 500 patients per day. St Mary’s Clinic is located in the area but is not as popular as the Reuben Centre as the services are more expensive. [6]



Number of people per public toilet



Percentage of population within 50 meters of a public toilet



Toilets

Mukuru suffers from a severe lack of toilets which aggravates overall health conditions in the community and forces many individuals to defecate in the open. Kwa Reuben has an average of 741 people per public toilet, while Kwa Njenga has an even greater shortage, with 840 residents for every one public toilet. These figures far exceed the Sphere Standards for sanitation which recommends that a single latrine be used by no more than 20 people. Overall access to sanitation facilities is equally poor, with only 52% of residents living within 50m of a toilet facility, the majority of which are pit latrines [10].

These toilets are frequently not well maintained and are not connected to existing sewer lines, which can lead to contamination of the surrounding water and soil. Many toilets are pay per use at a rate of 3 to 5 KSHS per visit which constitutes a significant financial burden to families over time. Additionally, these toilets are often closed at night, which further limits accessibility. Women and children are most severely impacted by the lack of toilets resulting in frequent health issues include diarrhea and cholera.

Water

An additional challenge for Mukuru residents is access to clean water. According to MUST enumeration data, 97% of the residents do not have a water connection in their homes [1]. A majority of residents get water from privately-owned water kiosks and tap points, however they are frequently poorly maintained resulting in severe quality issues. Of the respondents to the MUST enumeration, only 43% of the respondents stated that they had adequate supply of water [1]. Lastly, residents must pay for water, with average cost ranging from 3 ksh to 10 ksh per 20 liter jerrican.

In the next section we explore Mukuru's challenges in context of the Nairobi Master Plan...

TOWARDS THE INCLUSIVE CITY

Nairobi Vision 2030

65% of Nairobi in 2014



NAIROBI MASTER PLAN

In 2012, Nairobi City County (NCC) embarked on a process of formulating the Nairobi Urban Integrated Development Master Plan (NUIPLAN) for 2014-2030. NUIPLAN is the 5th master plan in Nairobi's history, following:

1. 1906 Plan for a Railway Town
2. 1927 Plan for a Settler Capital
3. 1948 Master Plan for Colonial Capital
4. 1973 Nairobi Metro Growth Strategy
5. 2014 NUIPLAN

The first three plans were drafted by the British colonial government, and the 1973 was never fully implemented. Yet without a functional general plan after the 1973 Plan legally expired in 2000, Nairobi has been operating without a unified planning framework, causing multiple sectors of urban development to create separate, fragmented plans.

The purpose of NUIPLAN is to unite the existing plans under one land use framework and to fulfill the requirements of the 2010 Constitution, which mandates each city to create an integrated development plan and to realize Kenya Vision 2030 at the city-level.

KENYA VISION 2030

Drafted in 2007, Kenya Vision 2030 is a road-map for the country's economic, social and political goals, and outlines flagship projects to implement these goals. The overarching goal of the road-map is "to transform Kenya into a globally competitive and prosperous national with a high quality of life for all citizens by 2030".

Additional policy goals include:

- Achieve a 10% annual GDP growth rate by 2012, and sustain growth over the ensuing 25 years
- Build just and cohesive society with social equity in a clean and secure environment
- Realize a democratic political system founded on issue-based politics that respects the rule of law, and protects the rights and freedoms of every individual Kenyan
- Meet Millennium Development Goals (MDG) by 2015



NAIROBI MASTER PLAN

NAIROBI MASTER PLAN: THEN VS. NOW

Past master planning efforts in Nairobi have rightfully been criticized for segregating the population. They also have been blamed for disproportionately investing in wealthy neighborhoods while ignoring the areas of the city that house the vast majority of the city's residents.

However, the figures to the left demonstrate that little has changed to the city's planning ideology in the 70 years since the 1948 Master Plan for a Colonial Capital. Tatu City is an exurban sub-center identified in NUIPLAN that is envisioned to be a mixed-use development designed according to new urbanist principles currently popular in the west. It boasts a secure environment for families, world-class facilities, and economic and social development growth opportunities that support Kenya Vision 2030.

However, this future growth is detached from the current reality of where the vast majority of Nairobi's residents actually live and shows no attempt to integrate these residents into the plans. We see this as continuing the city's history of segregation and disinvestment in impoverished communities.

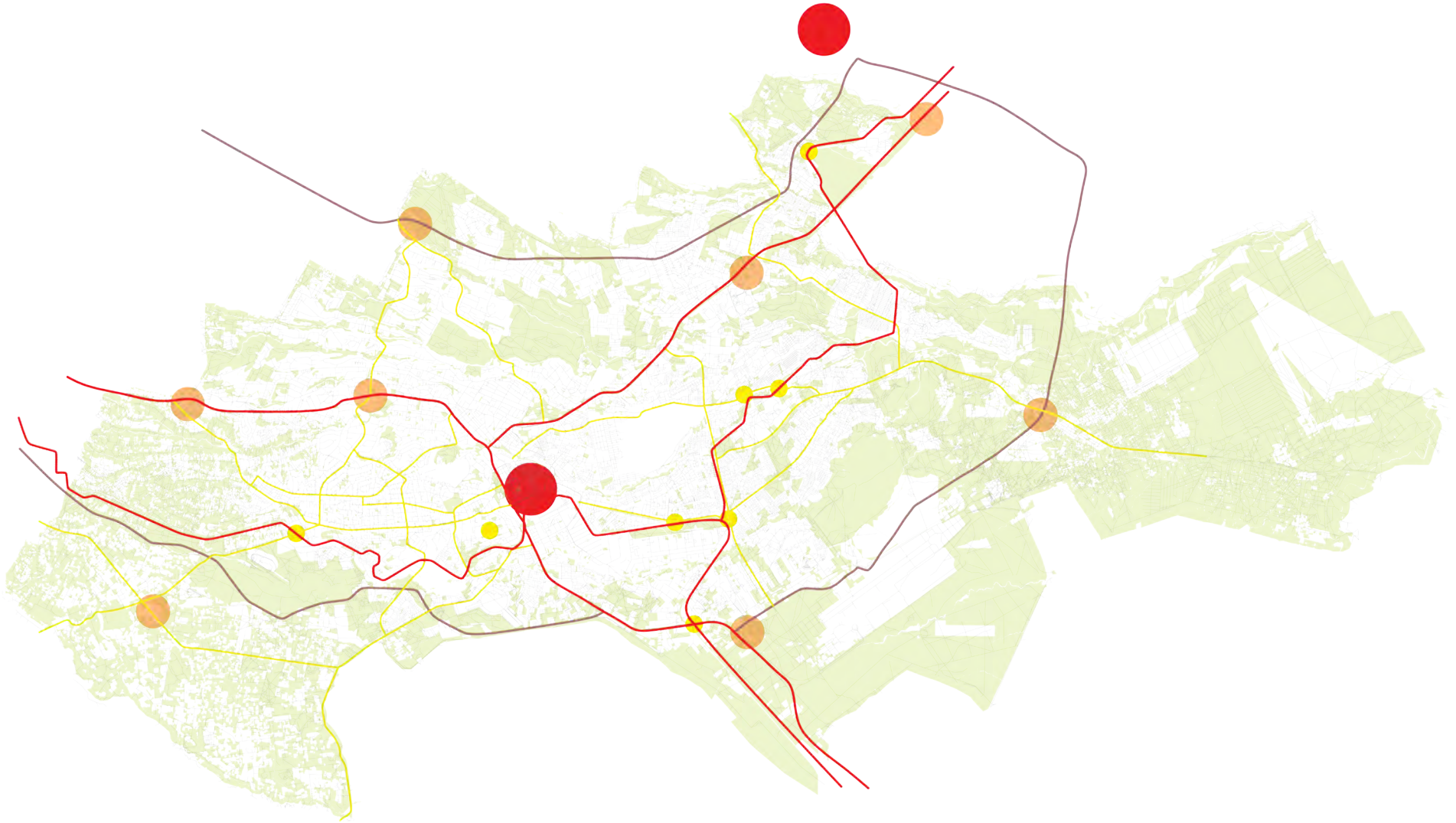


[1948 Nairobi Master Plan]



Tatu City [2013]

PROPOSED NAIROBI MASTER PLAN AND KEY DEVELOPMENT NODES



CITY DENSITY + INFORMAL AREAS

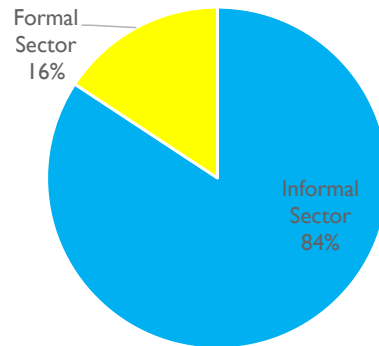
Informal Settlements as Economic Drivers

By focusing on current low-density areas and high income subsectors of the population, NUIPLAN neglects the current spatial distribution of Nairobi's residents and the critical role informal settlements play in Nairobi's economy. Informal settlements currently cover only 5% of Nairobi's total land area, yet house over 60% of the city's residents [1]. These individuals are marginalized by the public sector, but we argue that, in reality, they are the life blood of the city.

In 2013, 742,800 new jobs were created by both the formal and informal sectors in Kenya, yet only 116,800 of these jobs were generated by the formal sector [2]. This means **85%, or 626,000, of these jobs were created by the informal sector** - the vast majority of which employ individuals living in the informal settlements.

As the map indicates, the sub-centers envisioned in the current master plan are disconnected from this reality. By overlooking the informal settlements in the master plan, the city is ignoring the true foundation of its economic sector and accordingly, limiting its true potential for economic growth.

New Jobs Created in Nairobi - 2013



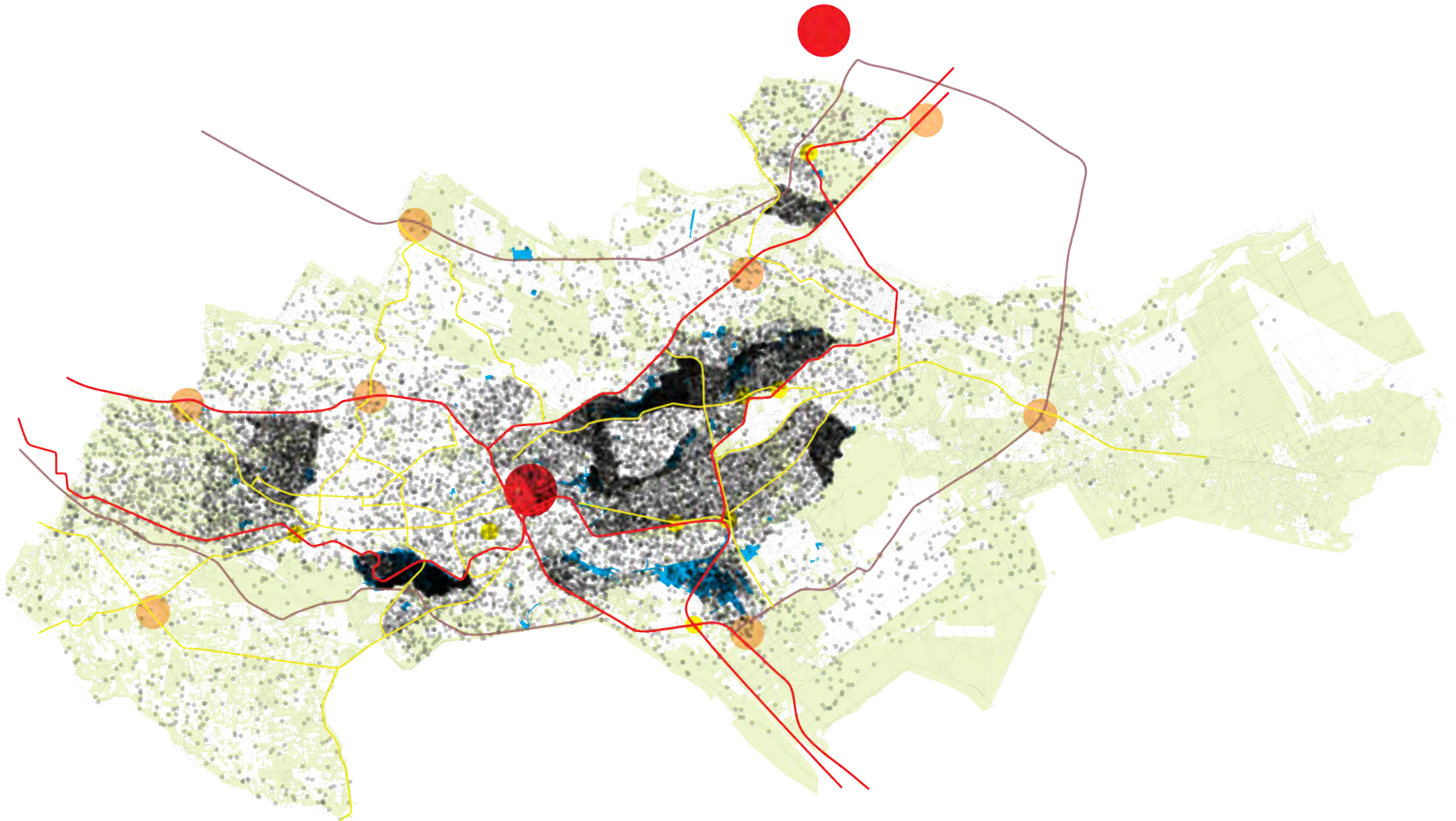
60%

*Percentage of Nairobi
residents that live in
informal settlements*

2.2 million

*Number of Nairobi
residents working in
informal sector*

**PROPOSED NAIROBI MASTER PLAN, KEY DEVELOPMENT NODES.
AND POPULATION DENSITY (dark shading) INDICATING MOST OF
THE INFORMAL SETTLEMENTS**



MUKURU REGIONAL SCALE

Phasing



Mukuru Regional Scale

As demonstrated in the previous section, informal settlements in Nairobi have not been adequately integrated into the master planning process. In order to assess how existing conditions and the current master plan affects Mukuru specifically, we begin with a regional approach before zooming into individual neighborhoods. The goal of this exercise is to continue to develop strategies and assessment tools for an inclusive city at multiple scales. As such, this section is a further evaluation of the existing opportunities and constraints in the area surrounding Mukuru, from the Central Business District Southeast to Airport North. Issues of access, physical barriers, surrounding land use, employment locations, housing, land ownership and environmental factors must all be taken into account.

As illustrated in the history section, one of the primary reasons the residents of Mukuru moved to this location is the proximity of the site to jobs in the industrial sector surrounding the settlement. While this proximity is an economic opportunity for many residents, it is not a sufficient employment area. The lack of connectivity to the greater region coupled with high transportation costs relative to wages are

a barrier to more diverse job opportunities and services the city has to offer. Such barriers impact both Mukuru residents and the city as a whole. Greater connectivity to the surrounding region is an opportunity for local businesses and markets to expand their customer base. In turn, lack of connectivity restricts economic potential of residents which limits the overall economic growth of the city as a whole.

We will first look at the transportation infrastructure currently serving Mukuru and address the gaps in the network. In proposing alternatives, we will not only consider integration to formal sector job centers, but also Mukuru's connection with other informal settlements and markets - recognizing both that the vast majority of residents currently work in the informal sector and that the informal sector accounts for 85% of new jobs in Nairobi, as previously illustrated.

Second, we look at the environmental conditions and land uses surrounding the settlement. Specifically, we attempt to identify spaces that can be used to better integrate Mukuru into the surrounding region.



REGIONAL INFRASTRUCTURE

Access and Barriers

Identifying a Mukuru Region within the greater context of Nairobi is necessary for the creation of Inclusive City Nodes, making visible major informal settlements as a part of a wider urban economy and culture. A primary tool for the realization of inclusive city principles is the development and maintenance of roads linking one central node to the next within Nairobi.

There are two primary forms of circulation in the Mukuru Region: formal and informal paths. The later reflects incremental amendments to a complex network of formal roads. Few formal roads enter Mukuru; rather they encircle the settlement. As a result, a number of informal connections enable access to employment centers, markets, and other day to day spaces. Connections to major roads are critical for the maintenance of economic vitality, and flexibility.

The following roads have been identified as necessary anchors to link Mukuru to the CBD as well as other Inclusive City Nodes:

- Lunga Lunga Road: A major road connecting to the CBD through the industrial zone.
- Enterprise Road: A relatively circuitous road that connects Mukuru to the CBD
- Mombasa Road: One of Nairobi's main interstate Highways.



PROPOSED NAIROBI MASTER PLAN, KEY DEVELOPMENT NODES:

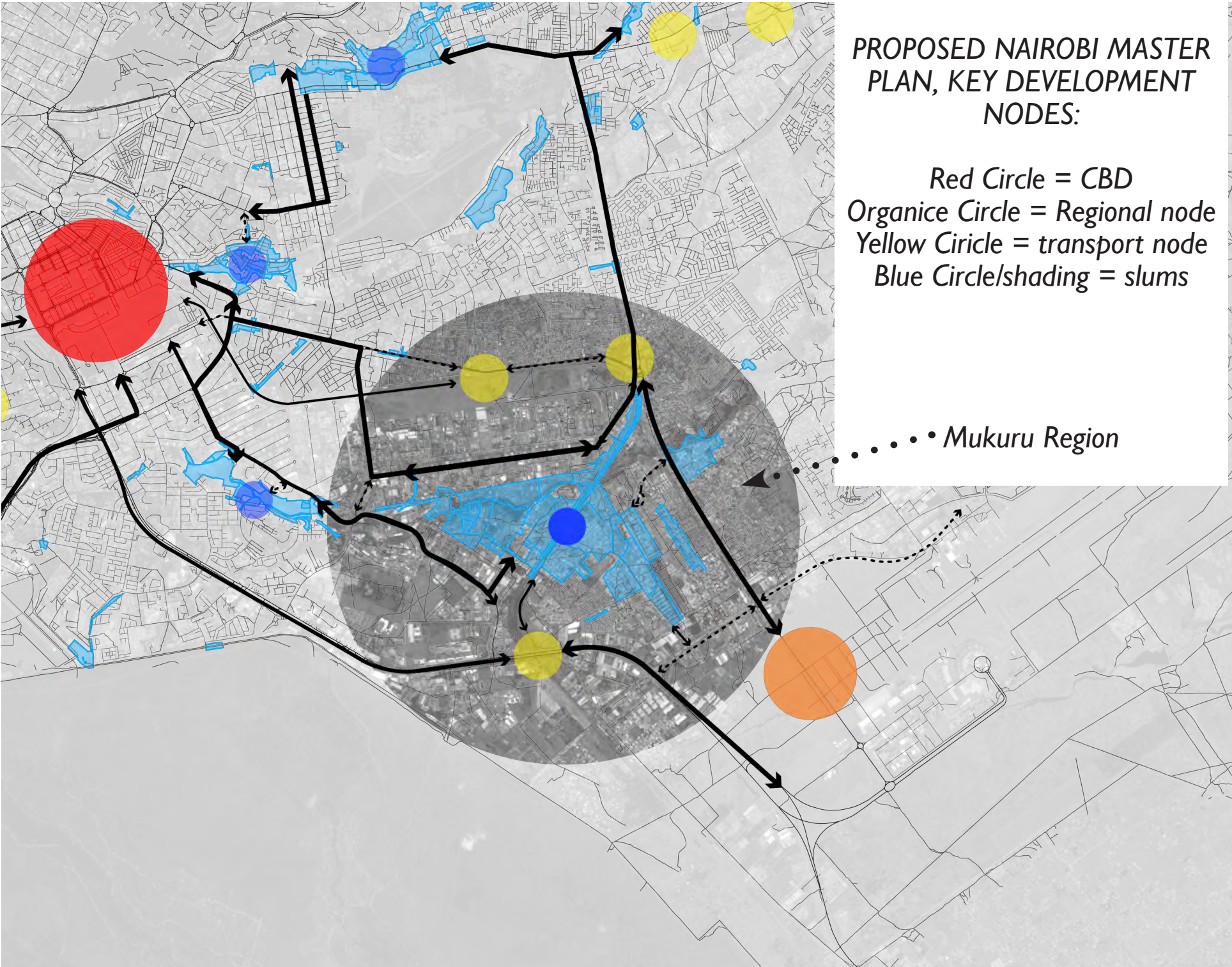
Red Circle = CBD

Organice Circle = Regional node

Yellow Circle = transport node

Blue Circle/shading = slums

..... Mukuru Region



ENVIRONMENTAL CONDITIONS

Land Use and Natural Factors

Mukuru is largely surrounded by industrial zones [PMNI] with a few pockets of residential areas to the south of the settlement and the eastern side. The industrial zones surrounding Mukuru are both an opportunity, as they provide much needed employment, and a constraint. The industrial areas can often be highly polluting, one resident reported having to cook inside due to high amounts of dust present in the air. Industrial plots are often surrounded by high walls, further barricading Mukuru from the region. This condition is particularly acute in the northern zone of Mukuru Kwa Reuben.

With respect to environmental conditions, Mukuru's land area is generally flat with a few gentle slopes in Milimani, Riara, Wapewape and Sisal. The Ngong river runs along the north end of Mukuru. It flows from Mukuru Kwa Reuben across the railway line and towards Sisal village. The river is highly polluted with solid waste [9]. There is an additional stream crossing through Mukuru Kwa Njenga along the north border of Moto Moto that is currently used as an open sewage line. This area faces additional complications, as it is prone to flooding during the rainy season [7].

Structures are built up to the river banks and this often results in some area being constantly flooded during the rainy season. This is partially exacerbated by the gentle slopes next to the river banks [6]. According to the elders of the different communities around 350 families have to migrate every year due to the seasonal floods around the stream that crosses the settlement and between Riara and Vietnam [9].

The area has been subjected to a lot of pollution and environmental degradation. The soil profile shows 50-70 cm of solid waste which reduces water percolation and traps waste and dirt. This results in very murky environments during the wet seasons.

There are three main informal dumpsites in the area: the former quarry near Sisal, along the stream water, and along the railway. The open stream in Mukuru kwa Njenga that flows through through Sisal is the main disposal point of human waste, where the human exhausters dispose the waste collected from the pit latrines all around the informal settlement. That same point is one of the main solid waste disposal points for the villages around.



CONSTRAINTS IN LAND USE

- The reserve for the railway
- Way leaves for the power lines
- Riparian reserve for stream water
- Way leaves for the planned roads according to the Structure Plan of Nairobi.

ENVIRONMENTAL MAP:

INCLUDES:
WALLS
RIVERS
OPEN SPACE
TOPO?

MUKURU NEIGHBORHOOD SCALE



Mukuru Neighborhood Scale

While the previous chapter discussed the external relationships the Mukuru region possesses, we now look internally at the complex overlapping network of villages, community spaces, and pathways in Mukuru. The data presented was collected and analyzed by project partners and presents a wide array of physical and social areas. Under the analysis of the UCB team such data and other observations have informed the identification of 5 goals for the development and maintenance of an inclusive city. They are:

- 1. Acknowledge Growth:** Identify zones that are inopportune for density of structures and recognize the continual ongoing growth of the city's population. Not doing so creates a brittle response to the needs present in Nairobi for the urban poor.
- 2. Community Assets:** Maintain and create vibrant neighborhoods with intermixed community and business spaces.
- 3. Opportunity Spaces:** develop integrated plan that utilizes open spaces and acknowledges sensitive areas.

- 4. Integrated Infrastructure:** Build upon existing roads for infrastructure, city-wide connection, and inter-neighborhood links.
- 5. Healthy City:** this goal considers all factors as simultaneous and interrelated, and represents the beginning to an approach towards upgrading the whole of Mukuru.



ACKNOWLEDGE
GROWTH

COMMUNITY
ASSETS

OPPORTUNITY
SPACES

INTEGRATED
INFRASTRUCTURE

HEALTHY
CITY

ACKNOWLEDGE GROWTH

Mukuru's Population

The MuST enumeration conducted in 2009 estimates the current population of Mukuru to be 287,000. Applying the Nairobi urban area average population growth rate of 3.0% suggests that the population will double in the next 20 years. This is quite a challenge, as Mukuru is already an incredibly dense area. A truly inclusive upgrading plan for Mukuru must accommodate the current population as well as plan for growth. Issues of land ownership and tenure must be comprehensively addressed. Upgrading strategies must also prioritize existing community assets and plan for a vibrant, healthy neighborhood with minimal displacement.

PRINCIPLES

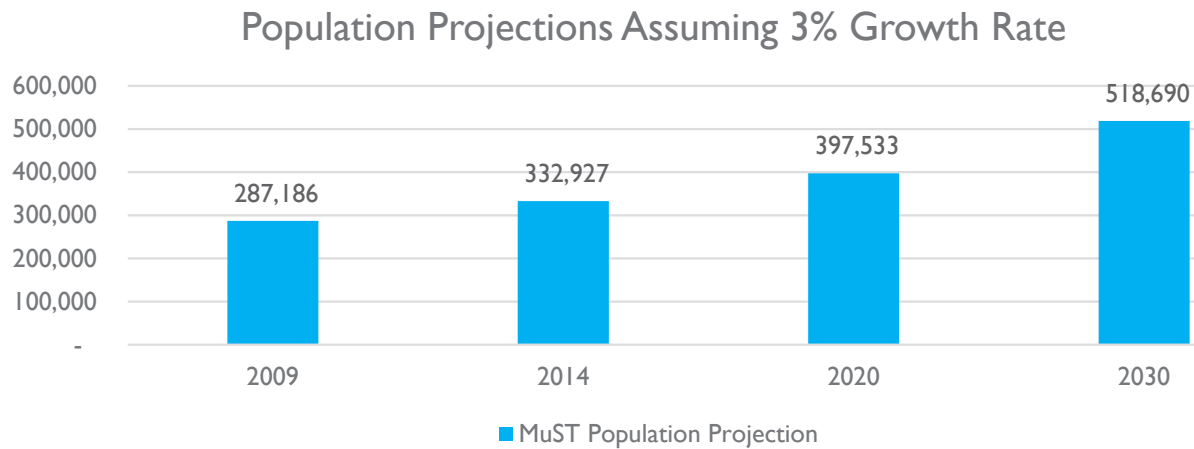
- Minimal displacement
- Plan for density
- Flexible commercial and institutional spaces

APPROACHES

- Link to existing and planned development
- Evaluate current neighborhood densities
- Identify zones that are inopportune for higher density of structures
- Identify underdeveloped and open areas in and surrounding Mukuru



Graph with # of schools, social centers, etc. or two more pie charts, or a nice big picture.



EXISTING CONDITION



ANALYSIS

Assuming a 3% annual population growth rate, the population of Mukuru will nearly double by the year 2030.

The average density in Mukuru is 421 persons per acre.



FUTURE VISION

COMMUNITY ASSETS

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Building on What's Here

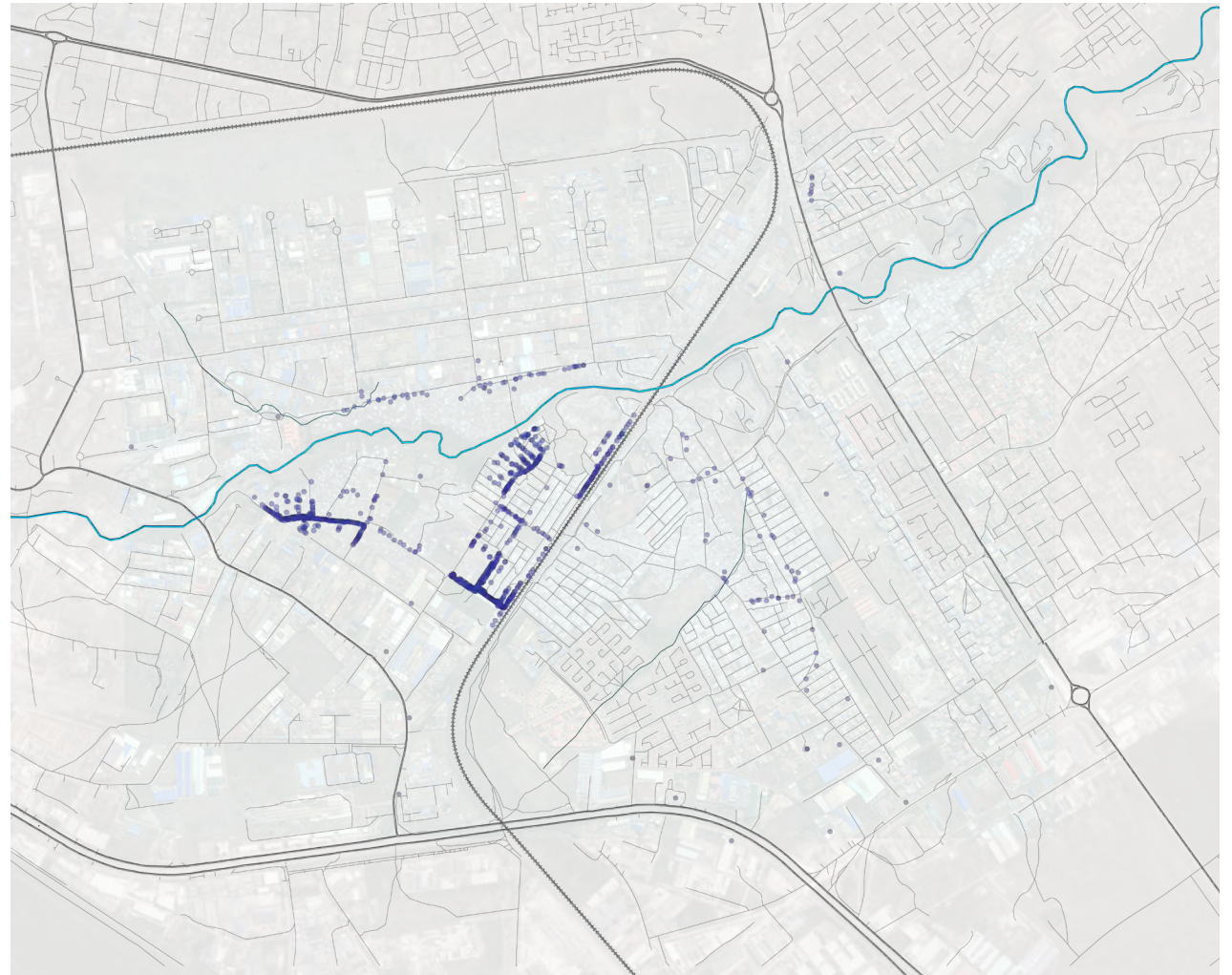
Since Mukuru's first settlers in the post-independence era, the neighborhood has always been home to numerous community centers, schools, churches and local businesses, vital to the health of the neighborhood. The village Feed the Children, for example, was named for one of the first community facilities in the area, started by the three daughters of an original settler, Cucu Gatoto (Must '12). An inclusive upgrading scheme must build upon and enhance existing locations of local businesses and community facilities. Current locations indicate potential for principal roads and interstitial open space.

PRINCIPLES

- Maintain community identity and visibility
- Community defined priorities

APPROACHES

- Identify existing local business and community facilities
- Build upon existing locations of local business and community facilities
- Create vibrant neighborhood with dynamic intermixed community and business spaces



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EXISTING CONDITION



ANALYSIS



FUTURE VISION



OPPORTUNITY SPACES

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Flexible and People-Centered

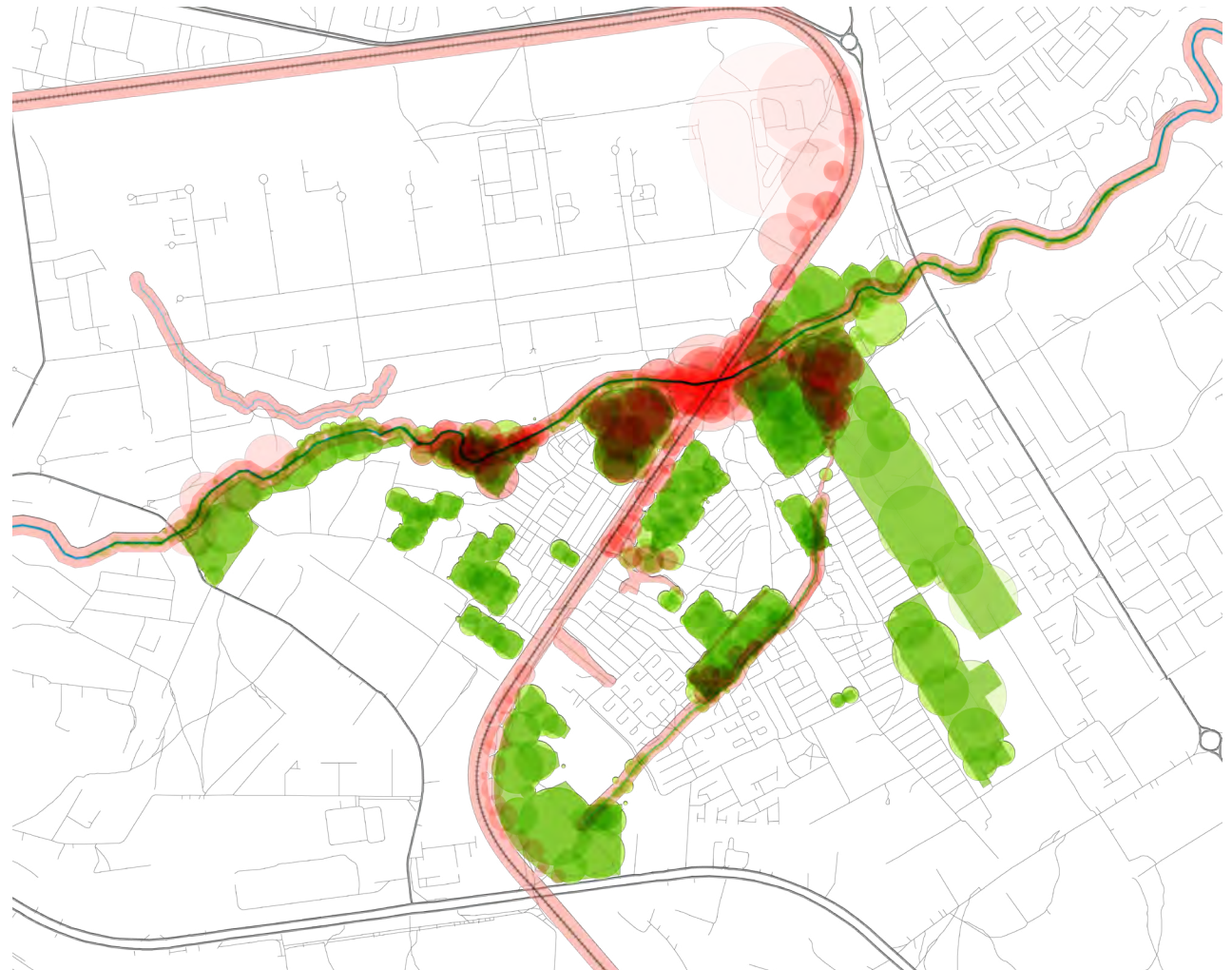
Physically, Mukuru includes areas that are sensitive to development, notably the rail right-of-way and riparian river area. The region also includes several institutional yards, pockets of open spaces, as well as large open areas outside the neighborhood's borders. Each of these land types present opportunities for flexible, site-sensitive development. A future vision for Mukuru imagines the coupling of opportunity spaces and community assets in the creation of a people-centered neighborhood where local businesses are located along accessible roads and community facilities are adjacent to open spaces.

PRINCIPLES

- Fleible spaces
- Opportunities exist in dense areas, as well as in open spaces

APPROACHES

- Analyze conditions of existing open spaces within and surrounding Mukuru
- Identify inopportune areas for development
- Develop integrated plan that utilizes open spaces and acknowledges sensitive areas
- Link play spaces to institutional areas



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EXISTING CONDITION



ANALYSIS



FUTURE VISION



INTEGRATED INFRASTRUCTURE

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Linking Health and Circulation

Integrated infrastructure can both organize space and create upgrading opportunities. This framework provides a more comprehensive perspective when planning healthy communities. It combines analysis of physical data with social, environmental and health factors. Mukuru faces a lack of basic infrastructure; water and sewer lines do not reach the majority of residents. As a result the population is faced with poor health outcomes impacting social, psychological and economic well-being. Approaching upgrading through an integrated infrastructure lens takes into account the multiple needs of its population.

PRINCIPLES

- Prioritize edge connection and pedestrian circulation
- Ensure access to existing and new transport

APPROACHES

- Link circulation, water and electric infrastructure with social infrastructure
- Identify existing infrastructure as principal organizing element
- Develop integrated pedestrian network within and around Mukuru



On average, one toilet in Mukuru serves 791 residents.

There are no public transport stops within Mukuru.

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HEALTHY CITY

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Bringing it all Together

An inclusive city is one where all the neighborhoods are economically, socially, and environmentally healthy. A healthy city as a priority in settlement upgrading takes into account the four previously discussed values: acknowledging and planning for growth; building upon community assets; utilizing and creating flexible opportunity spaces; developing a plan for integrated infrastructure.

A healthy city is one where residents feel safe in their neighborhood, have access to city services, are able to open and run their own businesses, and enable a brighter future for their children.

PRINCIPLES

- Internal and external security
- Mixed-use communities
- Clean, safe and well-lit streets

APPROACHES

- Build on community assets
- Utilize opportunity spaces
- Acknowledge and plan for growth
- Develop plan for integrated infrastructure



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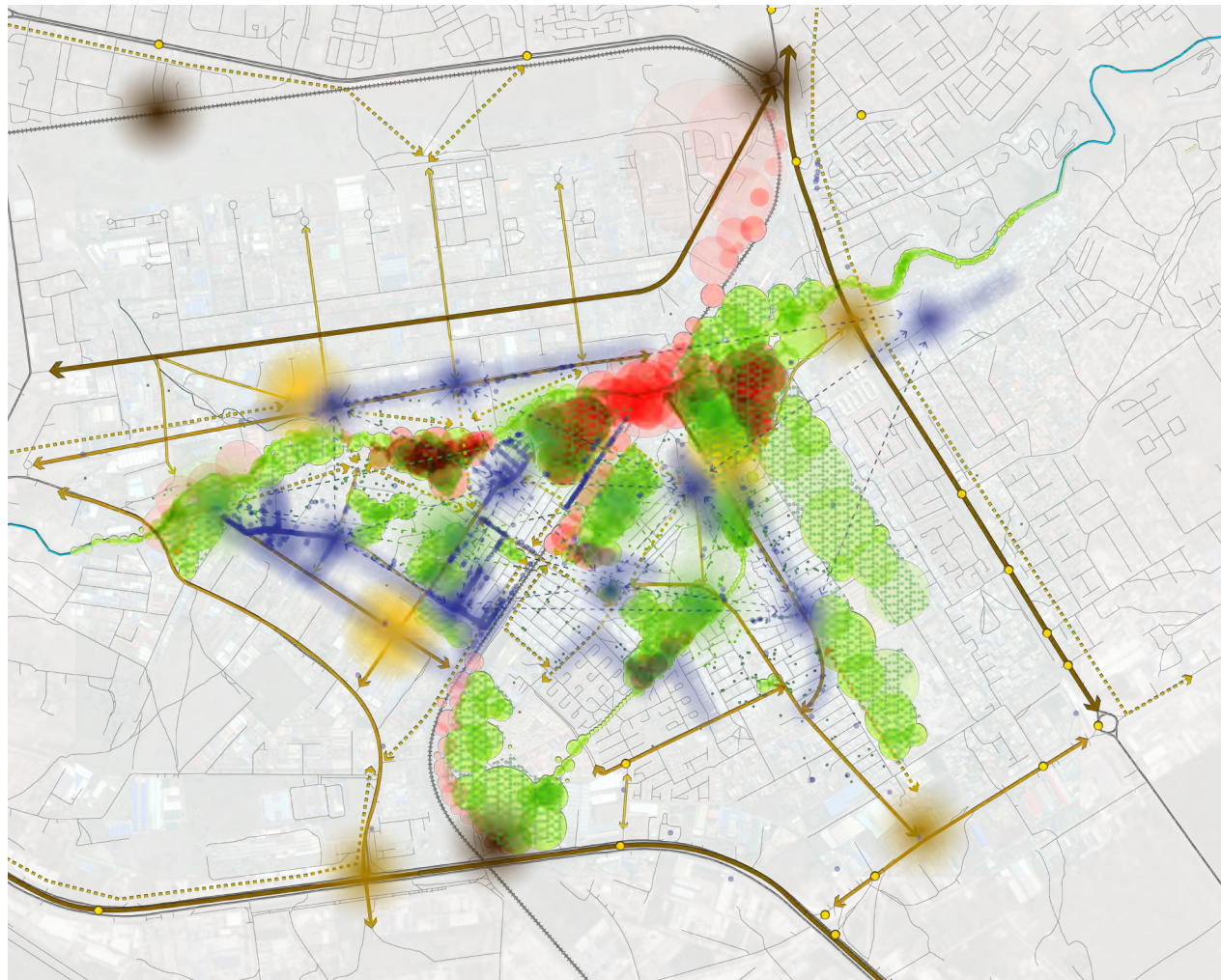
EXISTING CONDITION



ANALYSIS



FUTURE VISION



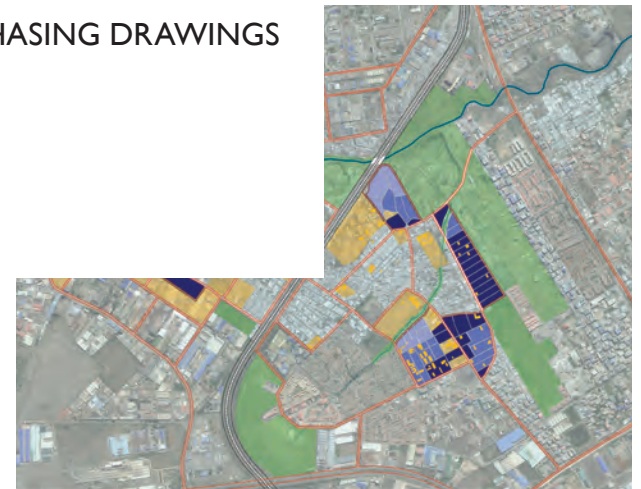
AN INCREMENTAL PLAN: MUKURU

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Phasing

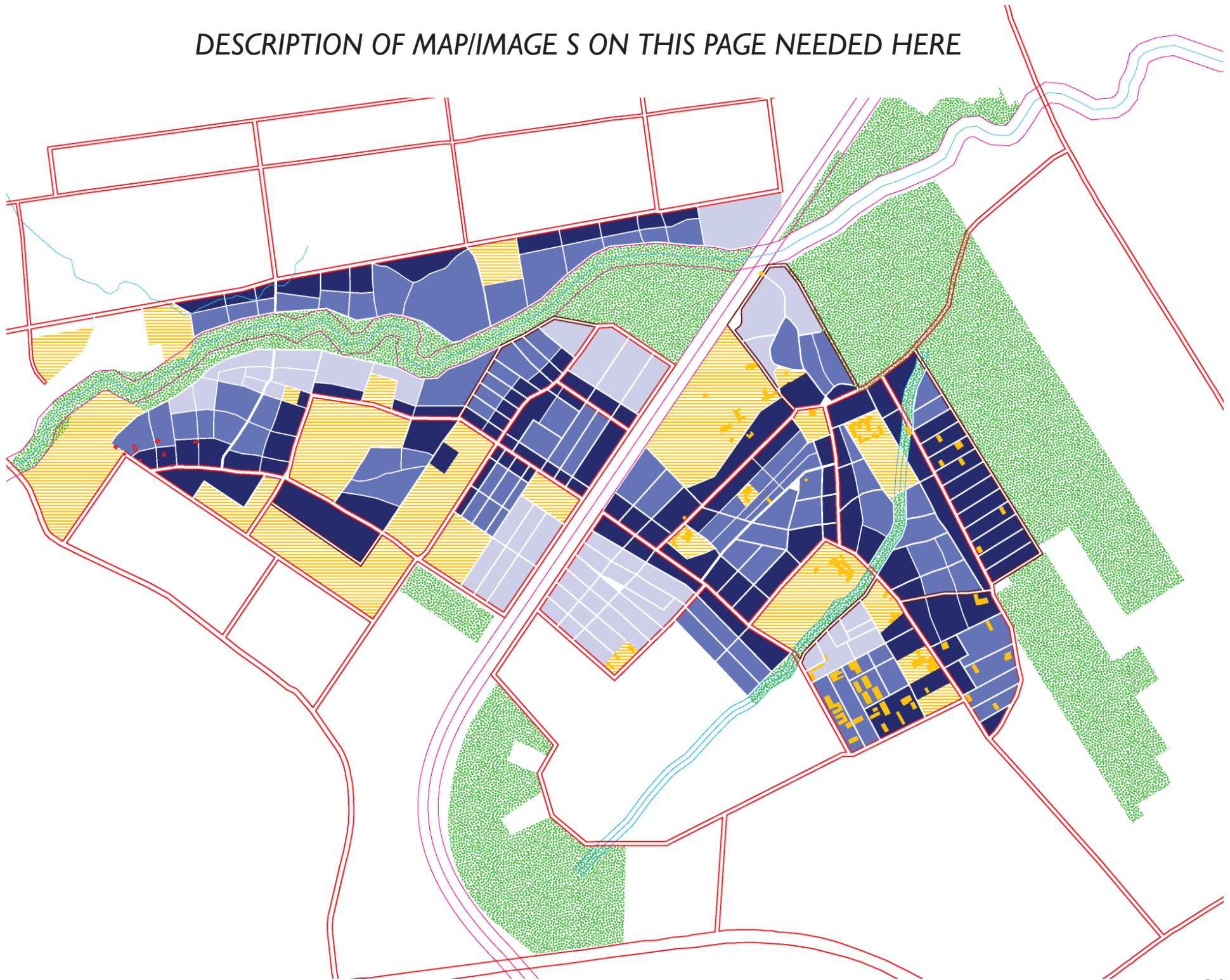
With 24 individual villages and around 200,000 residents, project phasing is key to an overall upgrading scheme. The following details an approach to upgrading that could happen in four phases over the course of several years. The final drawing is one future vision for Mukuru, rather than a set 'master plan'. This vision indicates five general land use areas:

1. **Residential/Commercial:** with highest percent of commercial use. These areas are along principal roads
2. **Residential/Commercial/Community:** with some smaller commercial facilities and community facilities.
3. **Residential/Community:** with mix of residential and community facilities. These areas are furthest from main, car accessible roads
4. **Existing institutional areas:**
5. **Open spaces:** existing, riparian zone, both inside and outside the community



MASTER PLAN PHASING DRAWINGS

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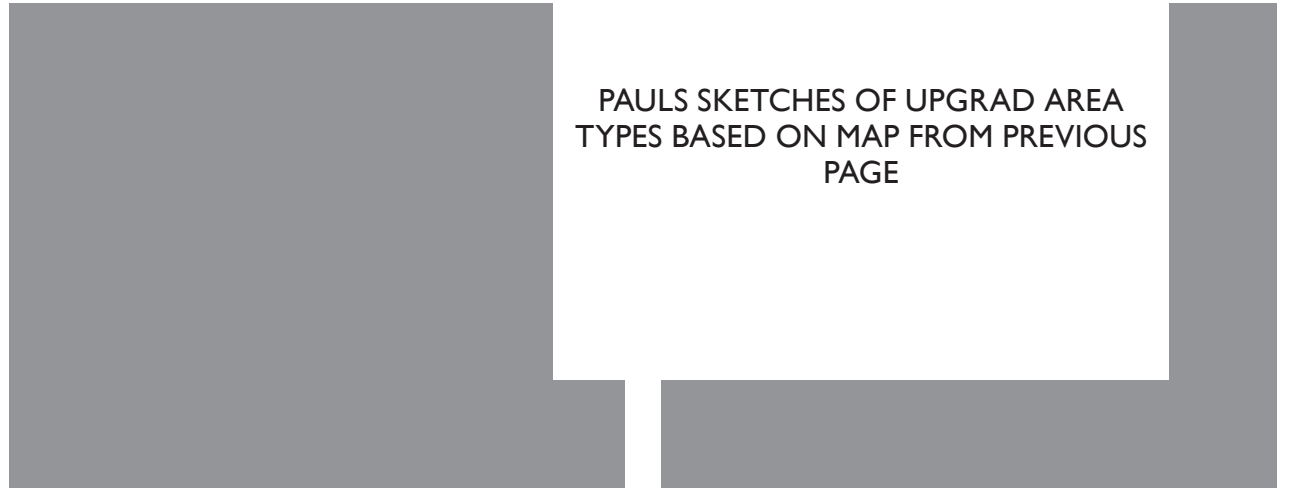


AN INCREMENTAL PLAN: MUKURU

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Future Vision Sketches

The following presents a preview of five land use types in this incremental strategy, from open areas to highly occupied multiuse spaces. The first two sketches display the two types of predominantly open spaces: the first is ecological reserves and the second is community institutional space used for recreation and more. The last three typologies were developed in response to existing and projected population counts and proximity to major thoroughfares. Areas with higher densities are oriented towards major roads that feature trunk infrastructure, while lower density areas feature smaller pedestrian roads.



FUTURE VISION IMAGE HERE?

AN INCREMENTAL APPROACH: SISAL

SAVINGS NETWORK. SISAL

CHOO
5/- NA
BAFU
5/- · 10/-

WAWAKE



Neighborhood-scale Upgrading

Implementing an upgrading project at the Mukuru scale can be a daunting task, both for the costs associated with such a large scale process and for the time required to carry-out the plans.

In this section, we offer an example of how the upgrading proposed in the previous pages could be implemented at the community-scale.

To do so, we use Sisal, a village in Mukuru Kwa Njenga, as a case study. This focus on Sisal is not meant to be taken as finalized upgrading plans, but rather should be seen as a framework that can be used to plan community-led upgrading across Mukuru when residents and other stakeholders are ready for the process.

In particular, we focus on the financing of informal settlement upgrading, recognizing that financing is often the principle barrier inhibiting the upgrading process. Creating upgrading plans that are cognizant of the needs of the local population is an important step, but unless they these plans are also grounded in the economic reality of the community and the other actors involved, the sustainability of the project will always be a challenge.

We start with a literature review to outline current best practices for the financing of slum upgrading. The review spans both articles published in scholarly journals and reports from the wide array of international organizations active in the slum upgrading field. This review is followed by case studies of successful slum upgrading projects relevant to the Mukuru context. In selecting our case studies, we focused on projects that have enacted innovative financing and land security approaches to meet their goals.

Next, we provide an in-depth analysis of the current demographics of Sisal to guide the upgrading process. This section both highlights the current situation of the community and the projected population.

This ultimately guides us to suggest various upgrading proposals which take into consideration both the population and financial constraints of the Sisal community. We address the actors and funding necessary to achieve holistic community upgrading, and also provide an analysis of possible land security solutions that can be used to ensure the sustainability of the model.



LITERATURE REVIEW

Criteria for Successful Slum Upgrading Financing

Sufficient financing is one of the greatest challenges in implementing successful upgrading programs [1, 2] Our review of the slum upgrading finance literature suggests there are five key components projects must take into consideration to maximize the potential for successful implementation:

I. Community Participation

Meaningful community participation is particularly important to resolve critical decisions such as collective land tenure, relocations, savings, type and quality of services, charges, cost recovery enforcements, enumerations and setting criteria for beneficiary selection. There are different approaches to bolster community participation, but the majority that have been proven effective integrate “tough-mindedness” while being “sensitive to public opinion” [8]. They range from group based savings requirements and collective land tenure allocation to community-led service provision. Such approaches foster participation as well as a sense of collective responsibility over the upgrading process [9].

2. Multi-scalar Sources of Finance

While there is no prescribed combination of finance sources for successful slum upgrading, offering diverse funding options (e.g., grants, loans, credit enhancements/guarantees, community savings, etc.) increases the likelihood of successful project implementation [10]. We identified six broad categories of finance: government, international development agencies, NGOs, the private sector, and local savings & cooperative unions.

A sustainable financing model should ideally contain a mixture of two or more of the above categories. The most effective way to enhance the production of low income housing and infrastructure provision is integrating government backed efforts, market-based solutions and business approaches with community-led efforts [11]. Community financing through savings of sweat equity is vital in fostering beneficiary’s commitment. In addition, large grants, subsidies or loans from government and bilateral/multilateral organizations not only enable the implementation of larger-scale projects, but also help bolster local community’s confidence in the upgrading process.

I. COMPONENTS OF SUCCESSFUL UPGRADING PROGRAMS:

- Active, on-going engagement of residents
- Multi-scalar financing options
- Comprehensive approaches to slum upgrading and financing
- Provision of housing and infrastructure using local technology and relevant standards
- City-wide, integrated approach
- Recognition of the role land security plays in promoting investments on land [3,4,5,6,7]

II. MULTI-SCLAR SOURCES OF FINANCE:

- Government: social housing, grants and subsidies, debt equity swap, loan guarantee
- International Development Agencies: grants, loans
- NGOs: micro-finance, financial training
- Private Sector Banks: loans, mortgages
- Savings and Cooperative Unions - loans

III. LAND TENURE AND SECURITY, ROLE IN PROJECT SUCCESS:

- Encouraging private investment in housing by the poor as a result of the enhanced protection against evictions
- Enhancing the revenue base for local government through land rates and taxes
- Creating a basis for collateral that can be used by formal financial institutions to lend to the poor for housing and business



3. Land Tenure and Security

UN-HABITAT identifies land security as an essential element of slum upgrading [12]. Secure tenure can contribute to project success in several ways (see side panel III). The literature divides access to land in informal settlements into two broad categories – land tenure and land security. We found the most preferred form of land tenure in slum upgrading programs to be collective ownership. Shared tenure promotes local accountability, creates a sense of social security among residents, and also protects beneficiaries from market vulnerability [13]. Long-term security is also important in shaping voluntary resource mobilization from communities and other stakeholders.

4. Integrated Slum Upgrading Approach

Slum upgrading programs vary drastically in scope: some emphasize housing and infrastructure, others limit themselves strictly to land tenure or programs fostering economic development. Despite this diversity of options, there is a broad consensus that slum upgrading should adopt an integrated approach that views housing as an asset connected to other necessities of residents, including, but not limited to, social, economic and health-related outcomes [14,15]. This nexus can be explained by viewing housing as a financial, economic and social asset which has spillover effects to other development objectives [16, 17, 18] However, an integrated approach requires high levels of stakeholder coordination, large investments, and a relatively long implementation period that most financiers do not have the patience to tolerate [19,20] As a result, more fragmented approaches focused on infrastructure improvement and land tenure are frequently adopted. While not completely ideal, basic investments in infrastructure provide de facto tenure security to residents while at the same time improving living standards of residents. The perceived land tenure security as a result of infrastructure investments in turn encourages residents to invest in their units [21]. Governments are also more willing to borrow for infrastructure than for land tenure given the complex procedures necessary to secure land tenure [22]. Lastly, as slum residents tend to be impoverished, upgrading schemes should expand income-earning possibilities to help enable cost recovery for maintenance of services [23].

5. Institutional, Policy Integration and Political Commitment

Lastly, institutional and policy integration is helpful to ensure political commitment to upgrading projects [24,25]. This commonly take the form of formalized partnerships among stakeholders or the streamlining of development through association with national, municipal and state programs. In the context of Mukuru, the Kenya government has a central role to play in spearheading the process either through: direct involvement, the facilitation of land policy reforms, planning standards adaptation, or the provision of loans and subsidies. The government can reform housing and infrastructure standards, which enables greater use of appropriate technologies and other low-cost housing and infrastructure strategies [26]. In addition to reducing costs and allowing for optimal utilization of space, lowering standards in slum upgrading projects can help control gentrification that is commonly associated with upgrading projects [27] However, this approach is a difficult balance, as care should be taken to ensure the structural integrity of construction, and that lower standards do not eventually lead to increased maintenance costs over time [28].

CASE STUDIES

Background

As the literature review demonstrated, appropriate land tenure solutions and sustainable, multi-scalar financing models are integral to the successful implementation of any slum upgrading scheme. In outlining possible ways forward for the Sisal community, it is important to look at pre-existing programs both in Kenya and abroad to help identify how these best practices can be implemented. In this section, the financing structure, land tenure approach, and outcomes of three upgrading programs are highlighted: the Mchenga Fund in Malawi; the Community Land Trust model in Voi, Kenya; and the Baan Mankong Slum Upgrading Program in Thailand.

KEY FINDINGS

- Community savings are necessary, but not sufficient, part of upgrading schemes
- Community Land Trusts can be effective if the community is close-knit and willing to put in extra effort.
- Financers should allow adequate flexibility for communities to decide upon their own way forward
- Local materials and government planning concessions are key to ensuring affordable, community-appropriate design

*Map with locations
of case studies Here*



Mchenga Fund, Malawi

In Malawi, 65% of residents cannot qualify for limited conventional financing and less than 16% are able to afford a conventional house (Chapinduka and Cloete 2007). Under these circumstances, the most successful mechanism for financing upgrading has been the Mchenga Fund (“The Fund”), a microcredit revolving loan fund established by the Malawi Homeless People’s Federation and the Centre for Community Organization and Development (CCODE) (Houston 2010). The Fund is a grassroots movement of 50,000 members whose main objective is the provision of group loans to finance housing construction (Zelleza 2007). Since 2003, 1,583 members obtained loans from the Fund, 768 new homes were constructed in urban areas, and 100 new sanitation facilities were installed (Houston 2012).

Community Participation

The Fund actively involves members in the planning, design, and construction phases of upgrading. Members have a series of meetings to decide the design of the starter houses, followed by budgeting, where they collectively decide on construction materials. Standard minimum plot sizes for low-income housing in Malawi range

between 360 and 1,000 sq. meters. However, local non-profits and the federation members managed to negotiate with the Department of Physical Planning to allow for small lot sizes of 150 sq. meters (Zelleza 2007). The Fund also practices ecologically sensitive housing design as a means to reduce construction costs. Using low-cost, locally-sourced adobe bricks, the Fund has been able to eliminate transportation costs and has reduced deforestation associated with the process (Zelleza 2007).

Sources of Finance

Funds raised by members are used mostly for the procurement of materials such as corrugated iron sheets, and for payments of skilled builders and carpenters while selected federation members provide basic labor.

Prior to upgrading, most federation members had rented houses for Mk 300–2,500 (US\$ 2.10–17.60) a month. As such, designs were constrained to ensure affordability for the poorest households. Housing loans range from Mk 70,000 to Mk 100,000 (US\$ 500–715), depending on the cost of building materials per city. The monthly interest rate on loans is 1.0% per month, and the loan term is eight years with

households eligible for further loans after 50% repayment of current loans. The 12.0% annual interest rate for the Fund is low for Malawi, which had a private sector base interest rate average of 32.0% when the Fund was established (Zelleza 2007).

Challenges

A key constraint is that the Mchenga Fund has been the sole source of funding for upgrading projects countrywide. With 50,000 members all desiring subsidized housing loans, the Fund has been unable to address the huge housing demand of members.

TAKEAWAYS FOR SISAL

- Ecological building practices can both reduce construction costs and preserve local natural resources
- Housing design should reflect economic constraints of least well to do
- Integration of government planners key to achieve appropriate and affordable design
- Multiple sources of funding needed to scale upgrading to meet need

CASE STUDIES

Voi Land Trust, Kenya

The Tanzania – Bondeni Community Land Trust (CLT) experiment in Voi was the first Kenyan case of the community land trust model. CLTs constitute communal control over the land with individual ownership granted to improvements (i.e. structures) on the land. They help reduce the risk of land speculation and distressed sales by residents while still maintaining incentives that encourage residents to invest in incremental upgrading.

Community Participation

The Voi CLT is administered by a nine member board of trustees and supported by a 13 member resident's committee responsible for daily management. To help cover costs, community members must pay KSH 20 per month in membership fees. However, many residents cannot afford the membership fee which has led to some internal conflict within the community (Bassett, 2005).

Sources of Financing

The project was funded using foreign grants, community savings, in-kind land donations, subsidized loans provided to residents by the National Cooperative Housing Union

(NACHU), and monthly payments required of community residents. Kenya Railways Corporation and Voi Sisal Estates Ltd, the previous land owners, both donated the land to show support for the project while low-interest loans were provided by NACHU to support the community's housing upgrading efforts (Yahya, 2002). Community members paid for the infrastructure improvements and land preparations from group savings collected throughout the project duration.. The German Technical Cooperation Agency (GTZ) both covered the costs of planning and subsidized each house beneficiary to the amount of 8,000 KSH. Residents covered the remaining costs of the structure upgrading which amounted to roughly 18,000 KSH amortized over a two-year period with monthly payments of 750 KSH/month (Bassett, 2005).

Land Security

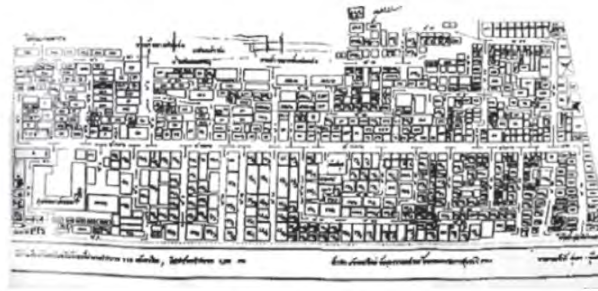
The Voi CLT project encountered several obstacles within the Kenyan land law system. One is that Kenyan land law contains a 'rule on perpetuities' which prevents the removal of land from the market. The Voi model freed itself from this requirement by creating two entities: the society and the charitable trust. The former

is in charge of day-to-day management of the organization while the latter was expressly created to hold the society's land, freeing it from the rule on perpetuity (Bassett, 2005).

Lastly, while the basis of the project was to secure a communal land title from the government, it must be recognized that the government never actually gave the communal land title to the residents. Instead, the government has provided a letter of allotment whereby the community trust leases the land from the Commissioner of Lands and in turn gives subleases to individual households (Midheme, 2013).

TAKEAWAYS FOR SISAL

- Long-term sustainability is a challenge given the strong community commitment required
- Kenyan land laws were not conducive to CLTs in 1990s, but new constitution gives greater flexibility to permit communal land titles
- CLTs cannot be implemented in isolation; integration into government policy required to ensure long-term success



The before-and-after site plans of Suan Phlu show a highly compact community re-blocked into a less dense development with a more defined grid pattern.

Suan Phlu, Baan Mankong, Thailand

Baan Mankong, Thailand's National Slum Upgrading Program, was created in 2003 to establish secure tenure and provide basic infrastructure and housing improvements in informal settlements across the country (Prachuabmoh 2005). In contrast to typical government-funded upgrading schemes, the design and implementation of Baan Mankong projects is managed directly by slum dwellers. To provide an example of how the project actually functions in practice, we looked at Suan Phlu, a slum community of at least 1,200 households located on Treasury Department land in Bangkok's financial district. The community was destroyed by a fire in 2004, and the Baan Mankong program was utilized to fund the reconstruction efforts for the 800 families who desired to stay. The remaining families chose to relocate to government housing (Nusser, 2010). As several households were relocated to off-site social housing, the resulting density after the upgrading scheme was much less than conditions in the community pre-fire (Nusser, 2010).

Community Participation

Under the Baan Mankong framework, the task of identifying, negotiating, and acquiring land for upgrading is allocated directly to the residents

of informal settlements. Residents are also responsible for determining the specific form of land tenure used (Boonyabantha 2009), though Baan Mankong requires the land remain under communal land title for the first 15 years of the mortgage to reduce the risk of gentrification. Beyond this period, the community is free to do with the land or structure as they choose.

In the Suan Phlu project, families were organized into sub-groups of 15 households, which served as small scale savings groups. Sub-groups also worked with architects to come up with their desired home design, varying from row houses to walk-up flats. Local labor was used for low-skill construction work, with private contractors hired to guide the construction process.

Financing

Under the Baan Mankong program, the Thai government provides soft loans for land and housing to communities through the Community Organizations Development Institute (CODI). To be eligible for these loans, a community savings group must be established with current savings equal to at least 10% of the desired loan amount.

Within this framework, Suan Phlu families were awarded \$425,000 in infrastructure grants and \$1.3 million in housing loans. Additionally, with the support of CODI, they were able to negotiate an agreeable long-term land lease price with the Treasury Department (Nusser 2010).

Country wide, around 10% of recipient groups opt for permission to use land agreements, 10% opt for short term leases, 40% use long term leases and 40% decide upon cooperative land ownership with communal titles (Boonyabantha 2009).

TAKEAWAYS FOR SISAL

- Government support does not need to adopt a top-down implementation structure
- Community control helps ensure locally-appropriate implementation strategies
- Allowing a menu of upgrading options better accommodates desires of each resident
- Incremental upgrading to house current density still a significant challenge

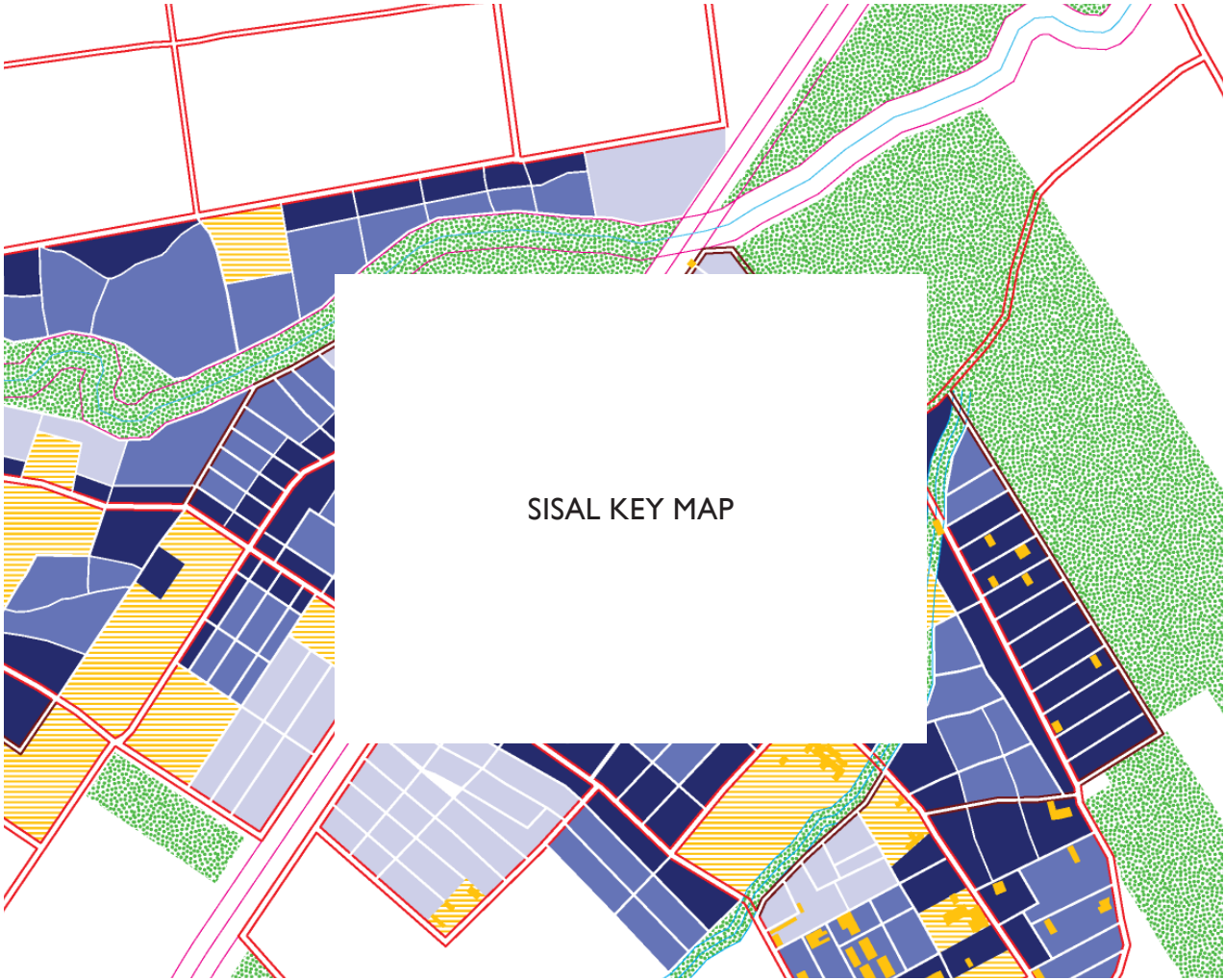
SISAL SUMMARY

Community Summary

Sisal occupies 23 acres of land in Mukuru kwa Njenga adjacent to the railroad tracks. The MuST 2009 enumeration estimates the population to be 11,900 persons; 3,955 households, with a population density of 364 persons/acre, slightly less than the kwa Njenga average, 419.

To understand how many individuals need to be accommodated in the development proposal for Sisal, population projections were calculated using the Nairobi Urban Area average growth rate of 3.0%. These projections indicate that the total population will nearly double in the next twenty years.

Population projections assuming 3.0% annual growth rate		
Year	Population	
2009	11,900	
2015	14,209	
2020	16,472	
2030	22,138	



Demographics

Sisal is unique from other villages in Mukuru in that it has a large number of one to two person households, leading to an average of 1.9 individuals per household. This is likely due to the fact that rents are currently low in the community (1000-1500 KSHS/month average), attracting many of the individuals who support their families outside of Nairobi by working in the industrial sector surrounding Mukuru. If we are to assume these trends will continue throughout the upgrading process, the proposed upgrading design should reflect this unique community attribute.

People Per Household	% of Households	Projected Households in 2030
1	55.90%	4,113
2	22.00%	1,620
3	10.17%	749
4	5.59%	411
>4	6.27%	461

Land Budget

With respect to the land available for development, Sisal has 3,018 m² of preexisting permanent community facilities that will be preserved throughout the upgrading process. As no land in the community lies within the flood plain, riparian zone, or rail right of way, this leaves 87,089 m², or 21.5 acres, of the 23 acres in the the community available for repurposing.

Regarding land tenure in the community, all of the land in Sisal is owned by Chandaria, which is a corporation that owns much of the land in Mukuru in general. However tenants pay rents to structure owners as is common for informal settlements across Nairobi.

In line with the industrial worker profile of the community, 68% of residents come from other settlements in Nairobi, and another 17% come from outside of Nairobi. Only 6% of the community was actually born in Sisal. The vast majority (94%) rent their units, which for most consist of informal structures built from metal sheets or spare wood.

Item	Land Area
Total Land	92,253 m ²
Permanent Community Facilities	(3,018 m ²)
Flood Plain	0 m ²
Riparian Zone	0 m ²
Right of Way	0 m ²
Total Developable Land	87,089 m²

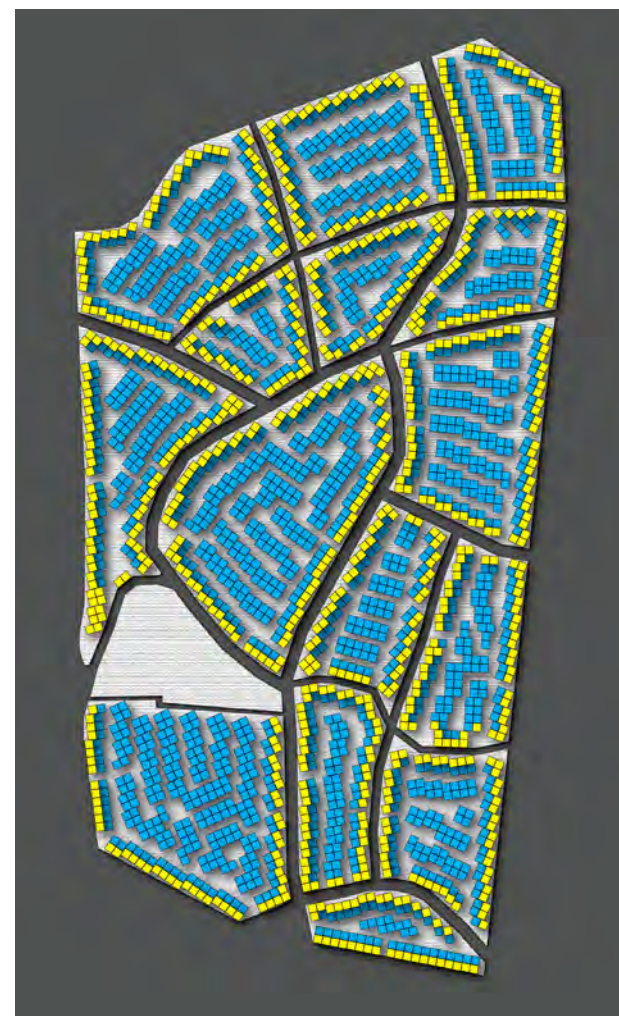
The next section explores upgrading approaches...

SISAL UPGRADING SCENARIOS

Incremental Approach

Under an incremental upgrading scenario, each household in Sisal would be allocated a 16 square meter plot for their structure. The benefits of this approach are that it can be built incrementally as personal finances permit, has low construction costs per square meter reflecting the use of local labor and construction materials, and that third floor bedrooms can be rented out, both providing households with supplemental income and adding to the overall population the plan can accommodate. AMT and other partners have already developed models to finance such an approach, though the incremental model would still require government or private sector support in the form of land concessions and infrastructure investments in roads and sanitation facilities.

However, similar to the Suan Phlu upgrading project, population density is an issue with this approach. The maximum number of households this approach could feasibly accommodate in Sisal is 3,829. This means Sisal would be unable to house its projected 2020 population, forcing any surplus population to relocate. This limitation of growth potential is a key weakness of the incremental approach, yet a common challenge when trying to accommodate such a large population on a relatively small plot of land.



Plan Summary	
Standard 32 m ² units	1,719
3 rd floor 16 m ² units	1,719
32 m ² units above commercial	823
Total residential units	4,261
Residential Land Use	
Surface area per plot	16 m ²
Percent of total land area	44%
Construction Costs	
Cost per m ²	KES 21,500
Cost per 16 m ² base unit	KES 344,000
Cost for complete 48 m ² unit	KES 1,032,000

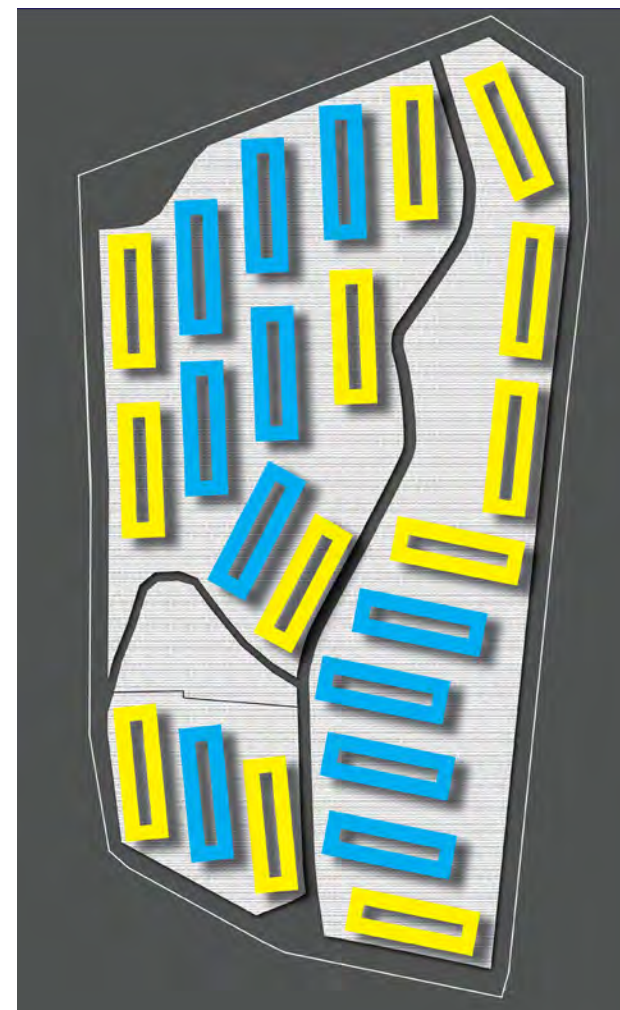
Cost Allocation	Nature of Contribution	Total Contribution
Kenyan Government	Land costs, road construction costs, housing soft costs, fee/permit waivers, tax exemptions	KES 792,840,642
Public Utility	Electricity and water connections	KES 86,631,360
Local Community & AMT	AMT loan for core, ground-floor house	KES 1,360,520,000 (KES 344,000/ Household)
Local Community	Second and third story housing expansion	KES 2,721,040,000 (KES 688,000 / Household)
Total Upgrading Costs		KES 3,276,860,346

Mixed-Use, High-Density Approach

In a mixed-use, high-rise model, households would be able to choose either 25 m² units or 50 m² units, depending on both financial capability and the household size. The housing type would be a fully-serviced five-story structure, with 50% commercial space on the ground floor. The benefit of this approach is that it leaves much more open space at the ground level and can achieve lower construction costs associated with standardized design. In this model, the government will cover land, infrastructure and soft costs, while the costs of residential and commercial construction are largely offset by cross-subsidy of market rate units. This cross-subsidy works to set 1,000 cross-subsidy units at prevailing market rates, leaving 2,900 units for Sisal residents.

However, the maximum number of households this design can accommodate is actually less than the incremental approach, even less than the current number of households in the community. Trying to build any more than 23 five-story buildings, as shown in our blocking design, would result in an extremely congested environment, while building higher than five stories would significantly increase construction costs due to the need for improved construction methods. This is a key challenge for this approach.

Plan Summary		
Towers		23
Stories		5
25 m ² units per building		50
50 m ² units per building		50
Total Residential Units		3,278
Residential Land Use		
Percent of Total Land Area		31%
Construction Costs		
Cost per m ²		KES 11,500
Cost per unit	25 m ² : KES 287,500	50 m ² : KES 575,000



Cost Allocation	Nature of Contribution	Total Contribution
Funds from Government	Land costs, road construction costs, housing soft costs, fee/permit waivers, tax exemptions	KES 721,559,124
Public Utility	Electricity and water connections	KES 132,912,000
Profit from Cross-subsidization	Revenue from sale of market rate units (KES 1,000,000 per unit)	KES 1,000,000,000
Local Community & AMT	Repayment of Construction Costs and Operating Expenses	KES 1,000,394,431

FINANCING OPTIONS

Financing Analysis

This financing table details the assumptions used to generate the funding estimates for the mixed-use, high-density model. The land purchase price was estimated based on AMT's Mukuru Greenfield site proposal, as were the residential construction costs. It should be recognized that the KES 11,500 figure is significantly below the current market rates, and therefore assumes significant use of local labor and also low-cost construction methods.

Overall, housing construction costs dwarf all the other expenses for this project, which will be a significant challenge if the community is expected to bear the burden of financing all housing construction. This is key challenge of the project that should be taken into consideration when implementing upgrading projects in Mukuru.

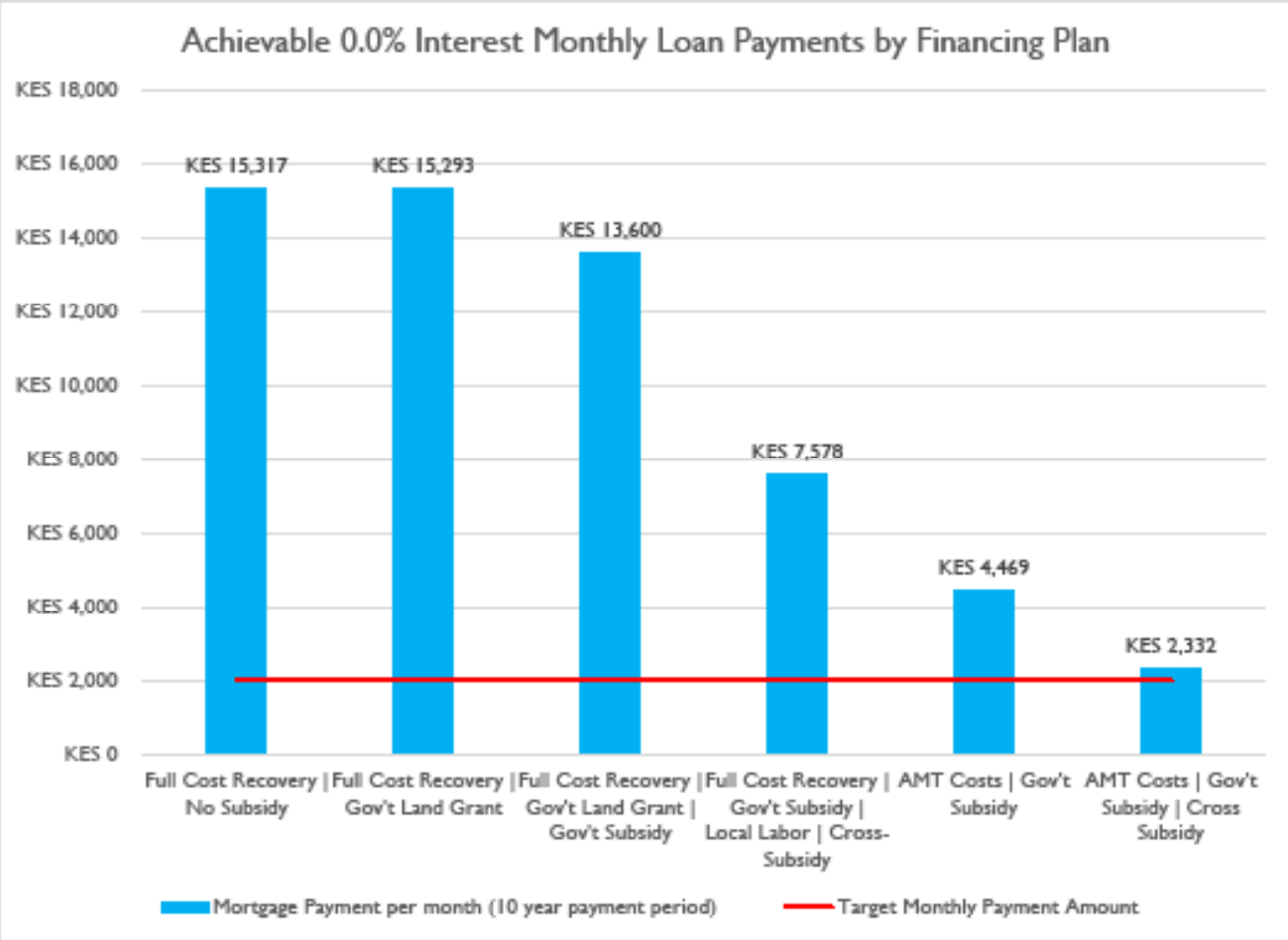
We recognize that a key consideration for any upgrading project is operating expenses, yet these currently are not included in the overall project costs for our models as we were focusing only on generalized, upfront construction costs. Such maintenance expenses should be taken into consideration when developing finalized financing structures to ensure sanitary conditions are maintained by residents into the future.

Project Costs	Cost/unit	Quantity	Total
Land			
Sisal Land Purchase	KES 500,000	23 ac	KES 11,398,072
Housing Construction Costs			
Construction Cost per m ²	KES 11,500	181,854 m ²	KES 2,091,321,451
Infrastructure			
Roads (per km)	KES 80,000,000	1.6 km	KES 128,000,000
Electricity Connections	KES 34,080	3,900	KES 132,912,000
Consultants/ Soft Costs			
Architectural & Engineering Fees	7% of project costs		KES 164,656,342
Fees/Permits			
Storm Water Drainage	10,000	1	KES 10,000
Application Fees	2,000	1	KES 2,000
Road Opening Fees	4,000	1	KES 4,000
Change of Use Permit	50,000	1	KES 50,000
Taxes			
Property Taxes	1% of pre-tax costs		KES 23,636,975
Land Taxes	8% of land costs		KES 911,846
TOTAL COSTS			KES 2,552,902,685

Making Slum Financing Work: Cross-Subsidization

The bar chart to the right details the stakeholders necessary to achieve an affordable monthly payment schedule for residents of Sisal. Starting from the left, it shows that, without the support of outside stakeholders (the government or an international development agency) an integrated upgrading program would be financially infeasible for residents, resulting in monthly payments upwards of KES 15,000.

Moving to the right, it demonstrates that government support in the form of a land grant would also not be sufficient; support with infrastructure, tax exemption, and construction soft costs are also necessary. Yet still, this still would not achieve affordable monthly payments for residents. Ultimately, a combination of government subsidy, reduced construction costs by utilizing local labor and other affordable construction methods, and cross-subsidization through the sale of market rate units are all necessary to making the scheme affordable for residents. This mix would leave residents of Sisal with monthly payments of 2,332 KSHS. It must be recognized that this still is above our target of 2,000 KSHS per month, demonstrating that still consideration must be given toward improving the model to achieve truly affordable financing for of the community.



LAND SECURITY POSSIBILITIES

Implementing Government Subsidy

The subsidies incorporated in the models are drawn from recent government efforts to enhance the protection of squatters through the adoption of the Constitution and the Kenya Land Policy 2009. The constitution provides that land be managed for the benefit of all citizens while the Land policy requires that the government : “facilitate negotiation between private owners and squatters in cases of squatter settlements found on private land; transfer unutilized land and land belonging to absentee land owners to squatters; and to facilitate the regularization of existing squatter settlements found on public and community land for purposes of upgrading or development”.

The land in Mukuru and Sisal Specifically belong to private land holders. This will require the government to enter into negotiation with the land owners to release if for the development of low income housing. Once land is acquired the community can build incrementally or involve the private sector.

Private Developer Ownership Model

In 2009, the government of Kenya put into place tax breaks and infrastructure subsidies to incentivize the private sector to provide low-income housing. Under a Private Developer model, the Mixed-Use High Density approach would take advantage of these incentives. The government will provide the land to be communally owned by residents of Mukuru. The private developer will hence provide equity to cover the cost of construction while infrastructure installation will be covered by the government and public utilities. Community will provide labour during construction as well as buy or rent housing from the private developer at a subsidized rate. Given that the various incentives haven't been tested at a larger scale, this model will require a high degree of trust and collaboration between the government, the private developer, Mukuru community and AMT. It will also require a highly organized community, a role we expect AMT and Muungano Wa Wanajiji will play. The government and AMT will work to ensure accountability of the private sector to the community.

Community Land Trust (CLT) Ownership Model

Because long term land security is imperative for the success of upgrading, the proposal is to have government provide longterm lease to the community.

Given the vulnerability of low income households to market forces and gentrification, the ideal land ownership for Mukuru would be Communal ownership in form of CLT. This model of ownership will ensure that upgrading benefits are preserved within the community. CLT requires that, if anyone wants to leave, their share of the property be sold to the community which in turn is sold to deserving low income households. As earlier observed, the number of units provided by using the various approaches is not enough to cater for the projected population. Using CLT will ensure that housing is available for low income households in the long run as well as guard against gentrification and buy out by well to do households. The challenge with this land ownership model, is the long term commitment, management and high degree of community organization required.

SISAL PROPOSAL: KEY TAKEAWAYS

Meeting the Goals of a Healthy City

The Sisal scenarios demonstrate the multiple challenges of upgrading in a setting like Mukuru. For one, it demonstrates that *in situ* development in Mukuru, whether incremental or planned high-rise construction, will still be unable to accommodate the greater population growth in the coming years. This highlights the need to seek out opportunity spaces in the surrounding region that can be used as part of a upgrading plan. Including these underutilized spaces will be necessary to help relieve the projected population density in Mukuru, but at the same time can be used to better integrate Mukuru into the surrounding region, eliminating the barriers that have come to segregate this population from the rest of Nairobi. While gaining access to this land will be challenging and potentially costly, we believe this approach will ultimately be in the best interest of the Mukuru community and the city as a whole if the true goal is to create an inclusive city as envisioned in Kenya Vision 2030.

Secondly, the Sisal exercise shows that financing to achieve a level that can be sustained by local residents requires significant support from outside stakeholders. Without multiple funding sources, upgrading at the scale necessary to improve the living conditions of the thousands of residents across Mukuru will be impractical.

To address this challenge, we see government subsidization of land costs, construction soft costs, and infrastructure as essential to a scalable model. In addition, more creative financing is possible by seeking the support of public utilities to cover the cost of electricity and water connections. This, we argue, is ultimately in their best interest as they see no revenue when residents pursue “sambaza” methods of stealing electricity and water. We also argue that some form of cross-subsidization will be necessary to help achieve affordable costs for residents. This approach can also be used to better integrate Mukuru residents with the greater Nairobi community.

Lastly, the previous page demonstrates that design and construction methods are not the only things that must be considered when proposing upgrading for Mukuru, land tenure is a key aspect that should be incorporated into the final proposal. A community land trust model with the community receiving cash flow from the cross-subsidization of market rate units could be an innovative approach to address potential gentrification, create community ownership of the project, and ensure the long-term financial sustainability.

KEY TAKEAWAYS

- Opportunity spaces in surrounding region necessary to accommodate projected population growth
- Outside stakeholders key to achieving affordable, yet scalable, upgrading for Mukuru
- Community Land Trust model with cross-subsidized units can be effective way to address gentrification while maintaining financial sustainability for community

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1. INTRO + WHY MUKURU

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10. Health Report - more info

3. INCLUSIVE CITY

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4. MUKURU REGION

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5. MUKURU

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6. SISAL

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