Informal settlements and Beira'sFuture

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Abstract

Every year disasters affect hundreds of millions of people, causing damage that can take months or years to recover from. The reality of carrying out the processes of reconstruction and recreating functionality is a complex and challenging task; too often, it is measured in several years.
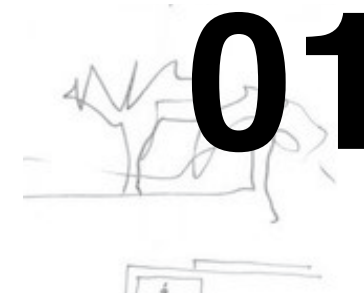
The issue to be addressed through this research is the possible scenarios for the recovery of damaged zones where people lose their properties and to improve the current situation in vulnerable urban zones. The group of people that the study covers are low-income families living in informal settlements.

And the study analyses this group in Beira post-disaster. This thesis develops an urban typology and process that can adapt to the changing requirements of the stages of the redevelopment process in a post-disaster scenario.

It explores the idea of a solution that can be applied to different zones in the city based on contextual analysis; the research question then amounts to '**can a solution be created that can 'evolve' to meet the needs of people in informal housings in post-disaster scenarios?**'

Keywords: *Upgrading , Afrofuturistic, Beira, informal settlements*
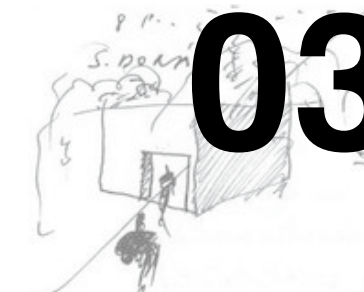
I n d e x

危机

The Chinese word for "crisis" is, in Western popular culture, said to be composed of two Chinese characters signifying "**danger**" and "**change point**".

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Chapter 01

Introduction

Thesis structure

It seems like the strategies and scenarios that have been running down to shape the future of Beira are with poor adaptability to the city's current situation.

The study of this project is divided into five chapters. It starts with the introduction, and it continues to understand what precisely **informal settlements** and **slums** are because these two names are repeated when it comes to the definition of the Citizens in Beira. After understanding the similarities or differences in the second chapter, the author tries to understand the causes and typologies, and approaches to these urban fabrics.

In the third chapter, the author starts studying the city in different aspects and factors that directly affect informal settlements and the slums, which are economic situation, climate, sanitation, relocation. At the end, she studies mas-

terplans through history that were designed for Beira. She ends this chapter by **questioning the absence of informal settlements as an integral part of the city in the master plan** and **zoning of the master plan regarding functions**. Another issue, which is quite essential to be noticed, is the relocation of the informal resettlement by the government, mainly regarding flooding and the poor condition where informal settlements live.

However, the analysis shows some of these relocations and resettlements are volunteers; they cannot respond to the objectives of the locations, which is improving the quality of life for people there relocated people.

Therefore the author starts thinking about what if we have another approach to informal settlements not only to address the climate issues and tropical cyclones disaster, that is different dif-

ficulties far from the settlements where they live but also to activate the city and integrating it with different potentials that it has like industrial zone that they live in and two somehow embraced the informal settlement as an integral part of the city rather than to eliminate them as it is clear and that in the masterplan of the future of Beira they are not considered.

In the third chapter, called Afrofuturism, she tries to find this connection and correlation between the Alton and the Motives that are present in informal settlements like slums like water, the role of women in the city and Society, and alienation, and some other factors.

Asimane Jorge Manjara (L), 19, and Marta Alexandre Goncalves, 18, wake up as they stay in shelter at the stands of Ring ground in Buzi, Mozambique, on March 23, 2019.

Houses lie flooded from Hurricane Katrina in the Gentilly neighborhood of New Orleans, Louisiana on Sept. 11

2005, Jerry Grayson—Getty Images

202956

She tries to bring up that informal settlements are an integral part of the future as if we can see in Afrofuturism approached and different potentials and the different case of studies that bring informal settlers into the vision of **future cities in Africa**. Therefore, she brings two case studies, one from the movie the "**b**lack panther" and the other which is the illustration of informal settlements present in the future of African cities, "**shanty towns**", that shows how these days artists Architects and different platforms demonstrate the presence of informal settlements and activation of cities in Africa through and within informal settlements.

In the last chapter, the project analyzes these factors and elements in the city and finds for any future interventions. The author tries to connect different elements that are presented in the city and introduce their potentials. Moreover, they can activate the city and the approach recently to this urban fabric-based and habitats reports and other studies reviewed for this thesis.

They are one of the cities in Mozambique located. It is a coastal city that has 80% of its population in informal settlements. At the same time, the city faces flooding tropical cyclone annual leave that makes the city integrate much more challenging to stay with life and for citizens. It is not very easy to recover from each year's event of such Yvonne's lifecycles. There are multiple interventions studies and international aids and investors to enhance and help the city to rise again, but with not much internal collaboration.

There is another aspect of Beira there are multiple potential that the city like Beira has in its strategic location through the history and the colonization it Can be understood how critical position it also has in regards to its connection to other important cities in this area like Telavi and Addis Ababa Ethiopia which are different important location economically and as we can see how they are connected in terms of urban growth and development.

It should be noted that the potentials of Beira can bring numerous advantages for this city in this regard; the other suggestions to make these potentials more visible through the approach of Afrofuturism and related somehow and connect and embraced it presents. The existence of informal settlements is an active part of the future of the city as it can be seen that in the future, such potential brings livability, economic growth, and many other positive aspects for this city, however, having in mind that climate change can hit the city the adaptation to climate change for cities like Beira is essential and of course without any second though one should consider this in any future approaches that could be done for this city.

Kakuma refugee camp

Kenya,
refugeecouncilusa.org

Research questions

This thesis tries to analyze and find an answer for the questions below regarding to the long term possible solutions for Beira.

1. Why not instead of **relocating refugees** from a part of the city to another, to try to think of this solution within the urban fabric?
2. Is it a way to **accept and upgrade slums** so that it becomes a characteristic of the city rather than to eliminate this tissue from the urban plan?
3. How such approach is possible to **remove the frontier between slums and urban zones**?
4. What motives should be included to Beira as a city in the future that has not yet considered in **spatial planning**?
5. How to improve the quality of life in **informal settlements after natural disasters**?
6. What types of **interventions** can improve the quality of life in slums in Beira?
7. Could these urban fabrics be counted as a n**ew typology able to survive in city**?

Informal settlements
Slums

approaches
why
where
how

ignoring
relocating
upgrading

far from public facilities
no long-term integration
people returning to slums after a while

Beira

to look at it as an event
locations with potentials

job
sanitation
community
flooding
importance of streets
master plan

Afrofuturism

nonwestern approach
locality
informal settlements in the future schemes

Chapter 02

Informal settlements and Slums

In this chapter, the author compares two words, 'Informal settlements' and 'Slums,' regarding different aspects. The chapter focuses on why these settlements have been grown, and how they deal with different approaches from the literature.

The Aftermath Of Tropical Cyclone Idai In Mozambique
A woman lays out rice grain to dry in the sun following the cyclone in Beira, Mozambique, on Thursday, March 28, 2019. Cyclone Idai hit the Mozambican coast earlier this month, devastating the port city of Beira and killing at least 700 people in Mozambique, Zimbabwe and Malawi. Photographer: Guillem Sartorio/Bloomberg via Getty Images
https://www.gettyimages.it/detail/fotografie-di-cronaca/woman-lays-out-rice-grain-to-dry-in-the-sun-fotografie-di-cronaca/1133269653?adppopup=true

__Introduction__

The growth of slums or informal settlements has become a significant issue over the past decades in developing countries. These settlements, known in different countries with various names, are observed for over 50 years in many cities. Studies suggest that informal settlements and(or) slums can be considered a permanent phase rather than a temporary transitional one. In this regard, it requires more studies and analysis (Satterthwaite et al., 2020; UN-Habitat, 2016)

As the most common form of urbanization, informal settlements host one-third of the urban population, and as expected, this number will rise to three billion by mid-twenty-first (Samper et al., 2020). Over the last ten years, the absolute number of people living in slums has grown considerably. However, statistics show that this population decreased from 39% in 2000 to 39 percent in 2010(UN-Habitat, 2008). The *paradox of informal settlements revealed in the ATLAS of informality*(Samper et al.,

2020)talks about informal settlements with different percentages showing their decrease from 29% in 2000 to 23% in 2014.

As the population increases by 10 million annually in sub-Saharan Africa, only one-third of it can move to "formal" urban areas. The other 7 million continue living in informal settlements or slum conditions (UN-Habitat, 2008). Due to no standard observation, there is no precise statistic about this population and their urban expansion, and the studies on hypothesis or general research make it more challenging to analyze such urban fabrics (Samper et al., 2020). The statistics mentioned above do not show if they are based on informal settlements studies or slums" studies. It is also unclear whether "informal settlements" refers to the same group called "slums" or these two words are misused instead of each other.

As the map illustrates(p.32), the *Atlas of Informality* project (*ATLAS OF INFORMALITY | Atlas of Informality*, n.d.)
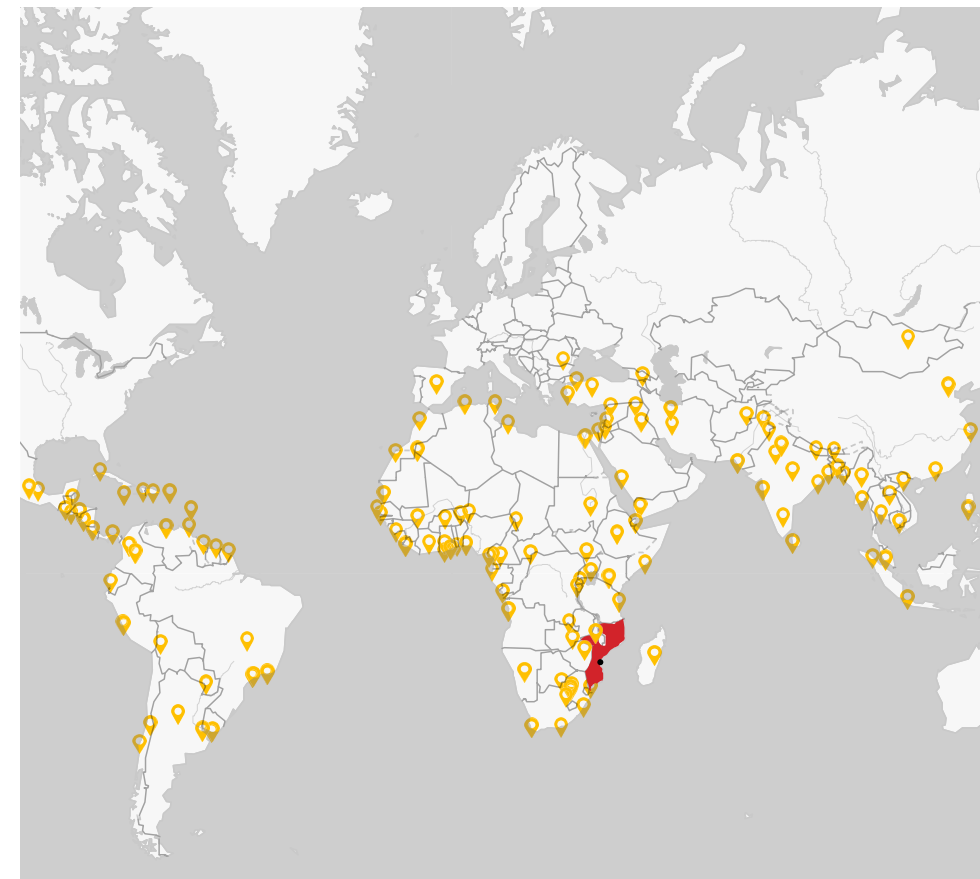
shows the location of 260 informal settlements globally. There is only Maputo marked as informal settlements from Mozambique.

Regarding this thesis topic, the author starts seeking a definition for this urban fabric as studies call different names for this group that is present in Beira. Therefore, the chapter begins with these two words' ("informal settlements" and "slums") etymology studies, and further, it continues with their typologies, causes, and solutions.

Informal settlements

*Glossary of Statistical Terms (OECD Glossary of Statistical Terms - Informal Settlements Definition, n.d.)*writes about informal settlements includes two definitions:

1.Areas where groups of housing units have been constructed on **land** that the occupants have **no legal claim** to **or occupy illegally**;

2.**Unplanned settlements** and areas where housing is not compliant with current planning and building regulations (unauthorized housing).

"Among the obstacles to comparative work on informal settlements is the epistemological complexity of defining what constitutes an informal settlement. Different organizations, national and municipal government agencies, and scholars disagree on which variables are determinants of an informal settlement. Defining informal settlements is a complicated endeavor; the literature on informal settlements, both current and historic, spends a significant amount of time attempting to determine the limits between formal and informal. Authors call attention to the need for more specificity in how informal settlements phenomena are defined and classified". (Samper et al., 2020)

In every country, depending on the context, the definition of informal settlements can have numerous implications, such as economic, social, or political. It can be discussed that as long as the meaning is related explicitly to region or country, there cannot be a proper measurement to understand the phenomena at a global scale.

Scholars defined informal settlements by different variables over the last 40 years, as shown in Table 1. It can be seen that there are three indicators repeated more than others: **Lack of safe water, Lack of sanitation, and non-secure tenure**. In addition, different authors added items like '**develop irregularity,' 'develop progressively,' and 'insufficient living space'** in recent years. Informal settlements are named variously globally though they have common characteristics. These settlements are called by a variety of names such as **informal settlers**, **squatters**, **maskwota** (in East Africa) **paracaidistas** or **colonos** (in Mexico) **okupas** (Spain, Chile and Argentina), and **favelado** (in Brazil) in different literature (UN-Habitat, 2016). It requires fur-

ther studies to demonstrate how these different words can relate together to provide a unique definition for informal settlements.

Even though historians agree on the unique form of informal settlements as an urban fabric, they find it difficult to define(Elleh, 2011).

Different names in each country change the definition of informal settlements as well as political initiatives. As mentioned in *The paradox of informal settlements revealed in an ATLAS of informality* in "Rio de Janeiro, what defines a fave-
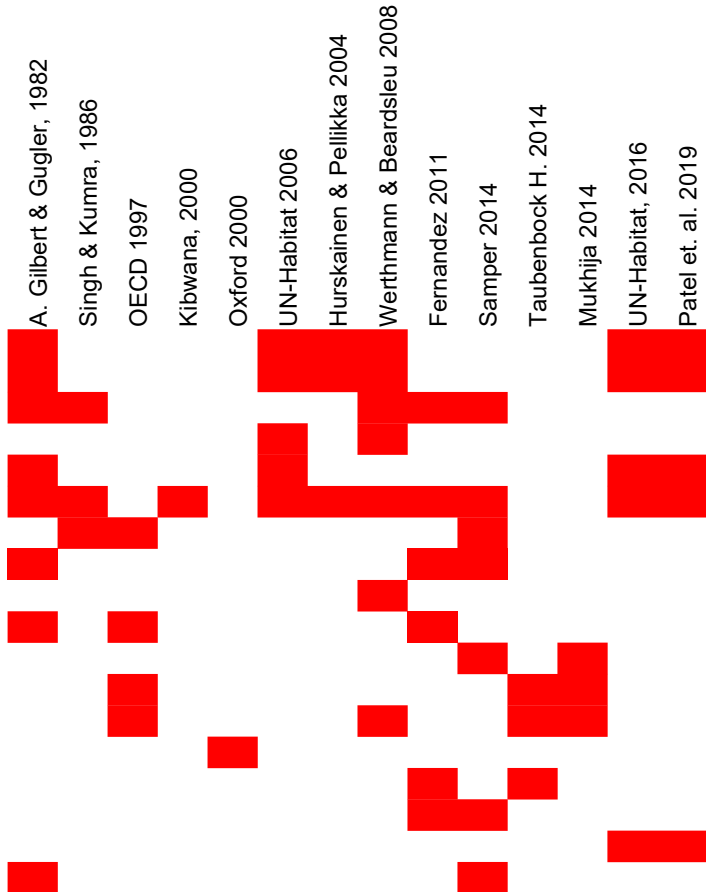
la, changes over the years and depends on the state initiative at the time."(Samper et al., 2020). Another example is Medellín, where areas marked as informal by city officials in the 70s are not recognized by the same city department in the next decade, even without any upgrades (Samper et al., 2020). The examples above explain how cultural, political, and economic aspects affect the definition of informal settlements.

	A. Gilbert & Gugler, 1982	Singh & Kumra, 1986	OECD 1997	Kibwana, 2000	Oxford 2000	UN-Habitat 2006	Hurskainen & Pellikka 2004	Werthmann & Beardsleu 2008	Fernandez 2011	Samper 2014	Taubenbock H. 2014	Mukhija 2014	UN-Habitat, 2016	Patel et. al. 2019
Lack of safe water	■							■	■				■	
lack of sanitation	■							■	■				■	
Lack of basic infrastructure and services	■							■	■				■	
Overcrowding	■		■					■	■					
Fragile structures														■
Non-secure tenure	■						■		■					■
Group of buildings	■						■		■					
Poverty			■											
Lack of quality of housing						■								
Illegal dwelling	■													
Self-Build														
Unplanned settlements								■						
No building regulations compliance														
Temporary shelters														
Develop irregularly										■				
Developed progressively										■				
insufficient living space													■	
Exclusion	■													

Table 1
Informal settlements multiple definitions by authors from 1982 to 2019

ref: (Samper et al., 2020)

Table 1 demonstrates some variables applied as defining characteristics of informal settlements across different scholars and institutions including governmental and non-governmental institutions these differentiations are related to either the purpose of study or the global-scale definition.
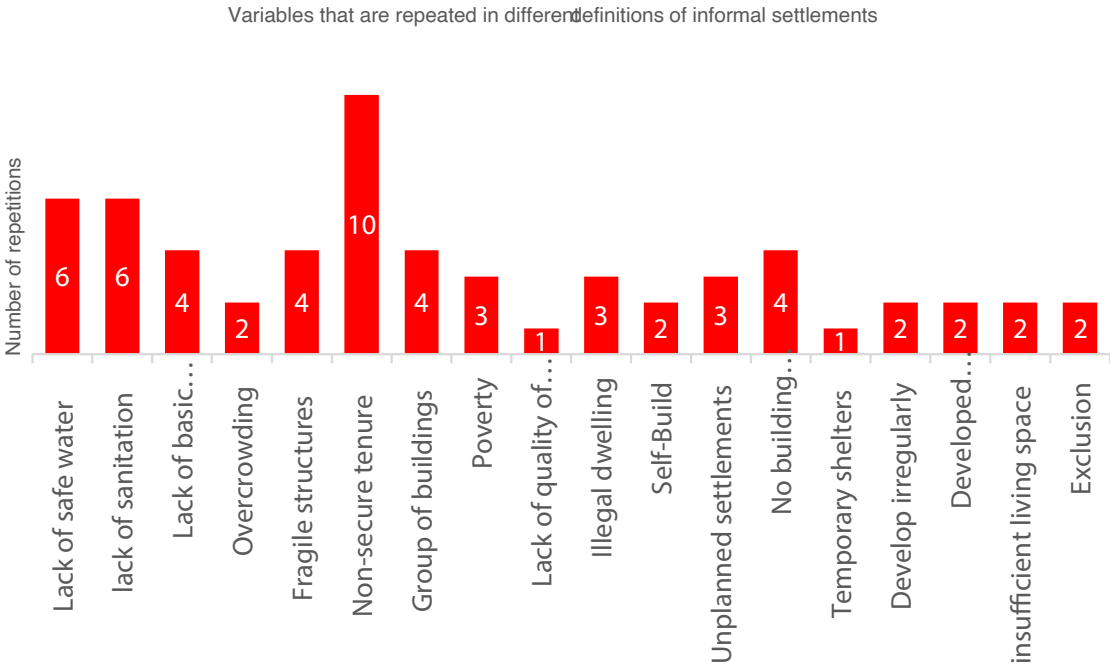
Typologies:

Informal settlements have different typologies, and these classifications are defined differently person by person(Ishtiyaq & Kumar, 2010). These different narratives are related to the purpose of the study. Even though scholars agree on the availability of multiple typologies(Dovey & King, 2011)-depending on the methodology of such classification(Tsenkova, 2012), they believe that defining four to nine typologies could help for better understanding of such settlement(Dovey & King, 2011). This chapter focuses on the differences between informal settlements and slums. The table below and the drawing on the next page explain these classifications based on morphology briefly.
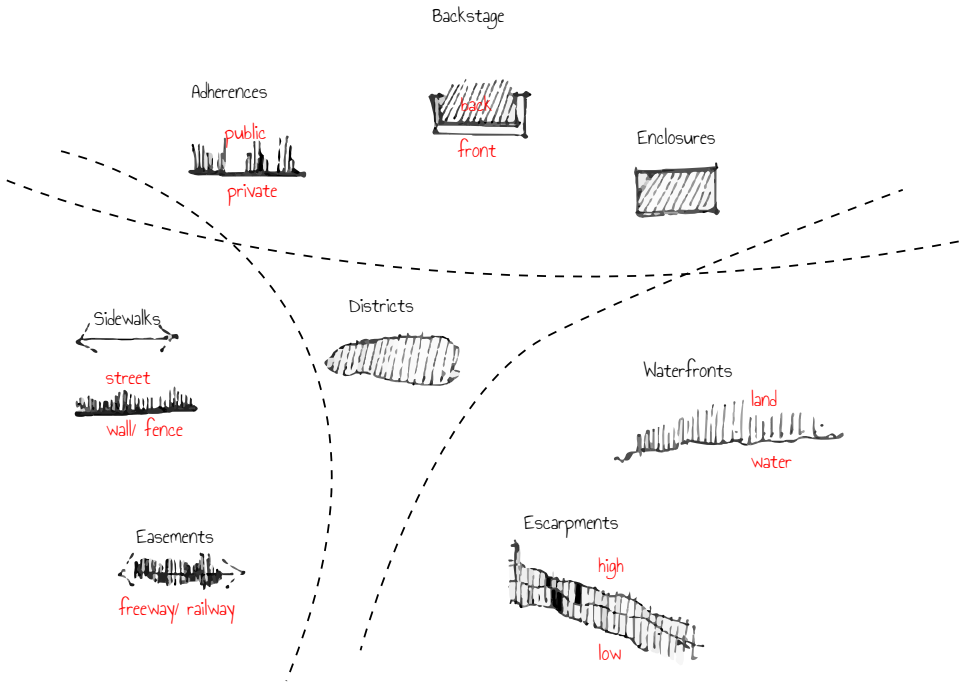
Variables that are repeated in different definitions of informal settlements

Number of repetitions

Lack of safe water	lack of sanitation	Lack of basic...	Overcrowding	Fragile structures	Non-secure tenure	Group of buildings	Poverty	Lack of quality of...	Illegal dwelling	Self-Build	Unplanned settlements	No building...	Temporary shelters	Develop irregularly	Developed...	insufficient living space	Exclusion
6	6	4	2	4	10	4	3	1	3	2	3	4	1	2	2	2	2

Informal settlements typologies

Ref: Redrawing of author, (Dovey & King, 2011).

	Informal settlements typologies	charactristics	Examples
1	**Districts**	Extensive mixed-use(retail and industrial) districts	Kibera (Nairobi), Tondo (Manila), Khlong Tori (Bangkok).
2	**Waterfronts**	Marginal lands between the formal city and the water(river, river, canal, or harbor)	Harbor and rivers of Manila, Indonesia, and Cartagena (Colombia).
3	**Escarpments**	Steep topography, a margin between formal city and mountains	South America, squatters of Caracas (Venezuela), and favelas in Rio de Janeiro (Brazil).
4	**Easements**	Located in infrastructure, freeways, powerplants, or sewer lines.	Dehli, Manila.
5	**Sidewalks**	Sidewalks with blank walls.	Mumbai, Manila, Dehli
6	**Adherences**	Informal settlements attached to formal facade	Bangkok, Santiago
7	**Backstages**	Informal settlements form primarily through attachment to or intersection between buildings.	Jakarta, Manila, Surabaya
8	**Enclosures**	Informal settlements are physically contained within a formal shell. Formal boundaries like institutional compounds, large buildings, or vacant fields set a limit for extensions.	Cemeteries occupation (Indonesia and Egypt).

Causes

Starting from the 1960s, international agencies like *World Bank* and *UN-HABITAT* began their urban development studies and improved housing and essential services. **The extensive urban growth of cities**, **mainly in rural-urban migration**, affected the necessity of large-scale affordable housing construction and policy. Multiple reasons, such as incompatibility of demand and requests, turned down affordable housing policy to some extent and led to informal settlements growth.

Satterthwaite argues about the variety of informal settlements in *Building Resilience to Climate Change in Informal Settlements* (2020)*,* squatter settlements as the land's illegal occupation is included in this category. Housing developments that are carried out without official permission but not on illegally occupied land are another branch of this category. For example, agricultural land purchased legally by an owner who transformed the function to residential would be illegal too. Another example is the occupation of such settlements by different groups, including displaced people or refugees. Informality also covers people who live in derelict housing rather than in camps.

Due to the lack of information on mapping the informal settlements, the significant studies are based on observations and mainly small-scale case studies. However, Informal settlements are more visible and tend to be located in high-value urban areas.

These divisions are visible in cities like Cape Town in South Africa, Paraisopolis, São Paulo, and the rest. In the **Unequal Scenes'** photographic project (p.38)by **Johny Miller**(*Unequal Scenes*, n.d.) he portrays this issue in different developing towns. It also challenges this thesis for selecting the site for the design proposal in Beira. Although governments try to address informal settlements with a unique approach, different informal settlements require diverse methods based on the causes and typologies of these settlements.
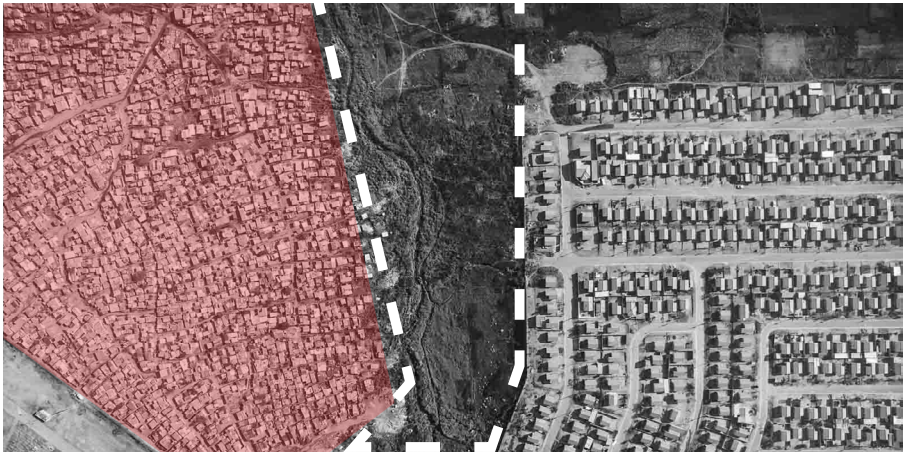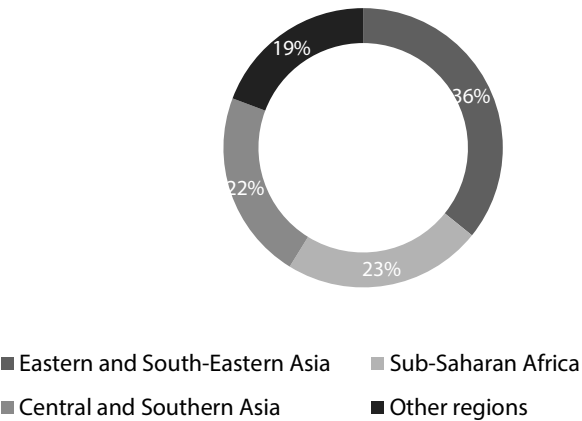
Slums

According to *Online etymology* (n.d.), in 1812, slum meant "**backroom**," later in 1825, the meaning changed to "**room**" though the most recent definition dates back to 1845 that isrefering to a "**dirty back alley of a city, street of poor or low people.**" What UN-Habitat describes for defining slums is the reflection of international literature describing their **precarious legality** and almost **non-existent level of services** like **community facilities, potable water, and waste removal**.

As discussed in the introduction of this chapter, statistics show the general decrease of such population while studying on a smaller scale demonstrates the increase within this fabric as they mostly are present in developing countries.(UN-Habitat, 2016). UN-HABITAT studies slums' through the definitions of slums in different cities, as is shown inpage 40(UN-Habitat, 2003).

Over the last 14 years, the percentages decreased by 9%, while the total number of slum dwellers has increased by 11.11%; however, it is estimated that it will rise to 28%. As the study done by the World Bank assessment shows, there is a considerable reduction in slums per the region over recent decades. In Latin America and the Caribbean, from 35% in 1990 to 20% in 2014, from 97 to 55% in South Saharan Africa, from 57 to 31% in South Asia; and 47 to 26% in East Asia and the Pacific in the same period; and from 39 to 28% in the Middle East and North Africa in 1990-2005. However, it should be mentioned that this macro-level analysis somehow hides within the definition of "slum" in the exact percentage of change of these settlements (Samper et al., 2020). However, the main problem with measuring slums starts with the lack of an agreed definition.(UN-Habitat, 2003)

Urban population living in slums or informal settlements, 2018 (millions of people)

Ref: https://unstats.un.org/sdgs/report/2019/goal-11/

- ■ Eastern and South-Eastern Asia — 36%
- ■ Sub-Saharan Africa — 23%
- ■ Central and Southern Asia — 22%
- ■ Other regions — 19%

Table 4
Slums definitions based on 29 case studies
ref:by author based on (UN-HABITAT, 2003)

Scholars agree on a common characteristic of slums, that is " a substandard neighborhood in some aspects".

Furthers it goes to details and introduces 5 indicators that a slum has one or more of them:

- the poor structural quality of housing
- overcrowding
- inadequate access to safe water
- insufficient access to sanitation and other
- infrastructure
- insecure residential status.
- And in general, a neighborhood lacks the minimum municipal facilities (UN-Habitat, 2015)

These indicators are present in the 29 case studies done by UN-HABITAT(UN-Habitat, 2003) and also shown on the graph as the mos presented factors.

Slums typologies

Slums are divided into different typologies that over the past decades have been identified. From 29 case studies that have been reviewed on The 2003 Global Report on Human Settlements (UN-Habitat, 2003),it has been found that in general, two types of slum can be defined: *"slums proper,"* on the one hand, and ***"shanties or spontaneous housing and urban development,"*** on the other.

The factors of legality and physical location both intervene in this categorization. In other words, *slums proper* refer to "inner-city residential" areas that were built legally but are in a poor physical condition that is also called "slums of despair." In contrast, spontaneous housing is mainly squatters, illegal or semi-legal urbanization on the urban periphery (UN-HABITAT, 2015).

According to studies, there is a wide range of slum typologies. Therefore, the photos on pages 43 and 44 show different slums in different cities.

Causes

In the first part of this chapter, the formation cause of informal settlements(that mainly was the migration and urban growth) was discussed. However, the answer is different for slums:

- Poor government policies
- the failure of the market and government to meet the enormous demand for decent and affordable housing
- low state investment in infrastructure
- an ineffective urban planning system
- Furthermore, a misdirected regulatory system, as well as the more general causes of urbanization and poverty, are often cited as causes of slum formation.

The seminal report The Challenge of Slums noted that slums "are not just a manifestation of a population explosion and demographic change, or even of the vast interpersonal forces of globalization. Slums must be seen as the result of a failure of housing policies, laws, and delivery systems, as well as of national and urban policies (UN-HABITAT, 2015).
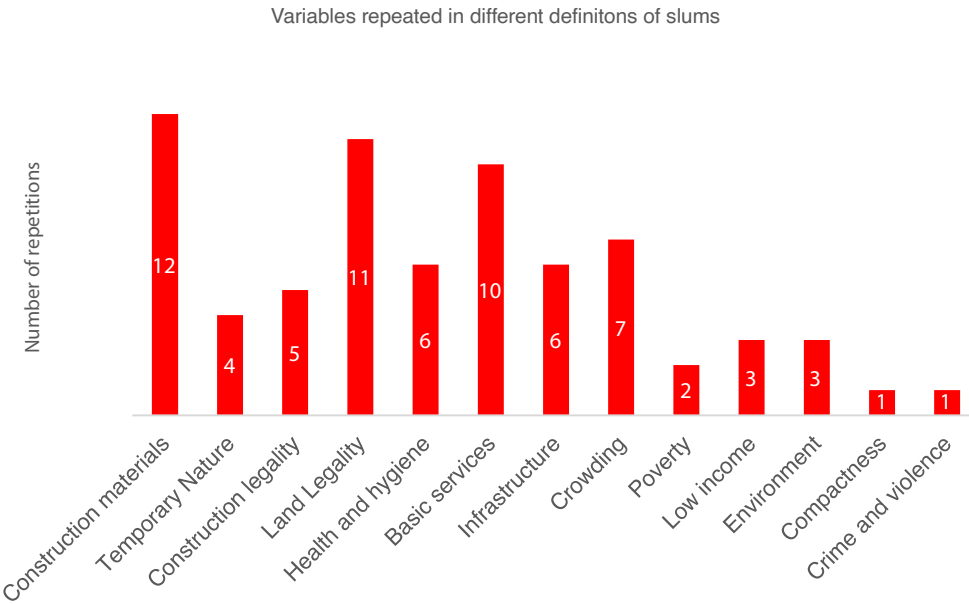
Variables repeated in different definitons of slums

Table 5
Slums definitions based on 29 case studies

ref:by author based on (UN-HABITAT, 2003)

Slums in different cities

Hurricane Tomas Floods Streets of Gonaives, Haiti

Streets and pathways are flooded after the passing of Hurricane Tomas in Gonaives, north of Port-au Prince, Haiti.

Photo ID 465289. 06/11/2010. Gonaives, Haiti. UN Photo/ UNICEF/Marco Dormino

Ref: https://www.flickr.com/ photos/un_photo/5492638210

Stilt houses in a Manaus city favela, area where flooding is.

AMAZON, MANAUS, AMAZONAS STATE, BRAZIL - 2016/03/14: Stilt houses in a Manaus city favela, area where flooding is likely to happen - garbage and sewage disposed directly on river, Brazil.

(Photo by J R Ripper/Brazil Photos/LightRocket via Getty Images)
Ref: https://www.gettyimages. dk/detail/news-photo/stilt- houses-in-a-manaus-city- favela-area-where-flooding-is- newsphoto/543291218?adpp opup=true

Complexo do Alemão

Complexo do Alemão is a group of favelas in northern Rio de Janeiro, Brazil.In 2012, the military forces left the Complexo and turned it over to civil police forces. Also in 2012, UPPs have began to be established in the Complexo, and government services have been extended the previous two years.

Credit: Ruy Barbosa Pinto

Ref: https://www.gettyimages. dk/detail/photo/complexo-do- alem%C3%A3o-royalty-free- image/169063057?adppop up=true

Slums in Iran

Ref: https://www.iranfocus. com/en/life-in-iran/34750- homeless-citizens-and-iran-s- housing-mafia/

Kibera, Nairobi, Kenya

Located just five kilometres from Kenya's vibrant capital Nairobi, Kibera is the world's third-largest slum

Image: David Leveene

Ref: https://www. designindaba.com/articles/ point-view/transformation- kibera-africas-largest-slum- promised-land

Slums neighborhood in the Dominican Republic

Ref: https://www.gettyimages. dk/detail/photo/slums- neighborhood-in-the- dominican-republic-royalty- free-image/516780267

Dar es salaam suburbs from the air

Taken on June 20, 2010 by: mbphillips

Ref: https://wwwflickr. com/photos/ mbphillips/8029130921/in/ photostream/

Urban slum

Kallayanpur slum,urban slums in Dhaka

Credit: Kibae Park

Ref: https://www.gettyimages. dk/detail/photo/urban-slum- royalty-freeimage/134846643 ?adppopup=true

The differences between slums and informal settlements

"Informal" often describes areas where there is a lack of basic infrastructure, poor housing quality, illegal dwelling, non-secure tenure, high urban density, lack of sanitation, poverty, and exclusion (Samper et al., 2020). In other words, informal represents features that do not exist in a formal settlement. Informal settlements are defined according to contraventions of specific laws, rules, and regulations. In contrast, slums are usually determined based on measures of housing quality, overcrowding, and the provision of urban services (Satterthwaite et al., 2018).

Enrique R. Silva, the director of international initiatives at the Lincoln Institute of Land Policy, describes (Will Jason, n.d.) **poverty and substandard living conditions** as the main characteristics of **slums,** whereas he defines **informal settlements** as **areas developed outside of planning regulations and legally sanctioned housing and land markets**. He notes that there is a significant overlap between the two groups, b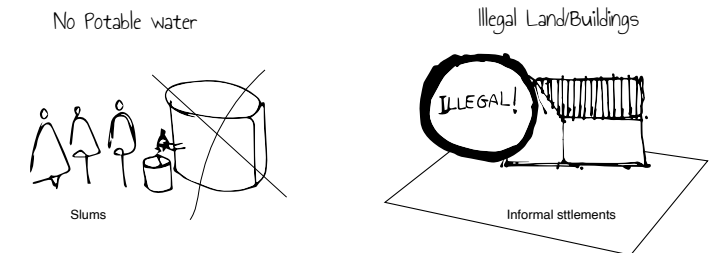ut some slums are part of the formal housing sector, and some informal settlements may have excellent living conditions and are actually relatively affluent (Will Jason, 2018).

As shown in the diagram on page 46, some characteristics must be present to prove that buildings belong to either informal settlements or slums, like poor water and sanitation in **slums** and illegality of lands or building in **informal settlements**. There are some other factors that might or might not be present in the definition of either group. Therefore, those factors cannot be the essential indicators to call a group of buildings either "informal settlements" or "slums."

Among these differences, this thesis tries to focus on the overlapping part of the two groups; since the urban studies in Beira show that the lands are not only illegally occupied but also people live in poor condition. Therefore the study group is mentioned interchangeably with "**informal settlements**" and "**slums**," considering they both refer to the same group.

Climate change effect on Informal settlements

Living in informal settlements itself brings numerous critical crises like health issues, construction safety, et al. Nevertheless, over the past decades, climate change- which is a critical issue globally and a threat to the population- triggers this group the most since it adds more vulnerability to its people.

No Potable water

Slums

Illegal Land/Buildings

ILLEGAL!

Informal sttlements

Main indicators of slums and informal settlements

Ref: Author

"*Urban climate-change-related risks include rising sea levels and storm surges, heat stress, extreme precipitation, inland, and coastal flooding, landslides, drought, increased aridity, water scarcity, and air pollution with widespread negative impacts on people (and their health, livelihoods, and assets) and on local and national economies and ecosystems*"(Satterthwaite et al., 2020, p.145)

Visit to Mozambique following Cyclone Idai- how climate change affects slums

A man carries his children after Cyclone Idai at Praia Nova, in Beira, Mozambique, March 23, 2019. REUTERS/ Siphiwe Sibeko

Ref: https://news.trust.org/item/20190327162323-nmosv/

Cities in Global South have 30%-50% of their population in informal settlements, and this number reaches higher in many cities; for example, in Nairobi, 60% of the population live in informal settlements, in Cairo 65%, and in Dar el Salam 70%. Informal settlements include half of Mumbai's population under different levels of slums like infrastructure, income, economy, ethnicity, and religion, squeezed into whatever space can be found, from bridges and railways to pavements and shantytowns (Satterthwaite et al., 2020). However, as statistic shows, this number is almost 80% of the population in Beira.

Historically, there were different approaches to slums through the range of ignoring them to site service and upgrading:

Ignoring slums is the first approach to them. This mostly happens when governments consider such group as temporary ones, while as discussed earlier in this chapter, it is not.

Using slums politically: in many countries, politicians exploit slums for their own benefits, mainly to express their supports for slums and promise them land titles. In the book *Arrival City: How the Largest Migration in History is Reshaping Our World,* Saunders explains such supports from Iranian leaders from Eslamshahr(an area close to Tehran) squatters as a winning point against Shah in Iran's revolution in 1978. He also mentions the same approach that Hugo Chávez had in Venezuela (Saunders, 2011).

Eradication, eviction, and displacement: such approach can happen for different reasons like large-scale development projects, global events
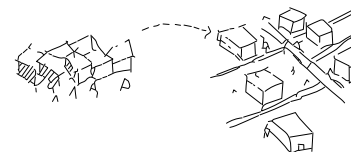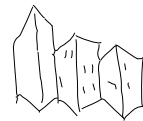
Ignoring slums
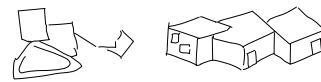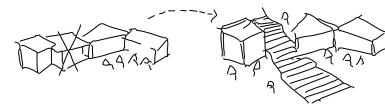
Using slums politically

Eviction, relocation

Public housings

Site and services schemes

Different approaches to slums

Ref: Author

infrastructure like World Cup Olympic Games, et al. Natural disasters like earthquakes, tsunami, hurricanes also is another reason for eviction that in Beira case happened.

Relocation: is another way to address slum dwellers so that the slum lands get redeveloped, and people are moved to places provided by social housing/ rental opportunities et al. However, studies show that during the 1960s and 1970s, such housing was not affordable for slums and mainly they were(and are) in the locations where increase the cost of transportation that is not affordable either. It should be mentioned that small-scale relocation can be necessary for upgrading programs. Taking environmental hazards as an instance, slums should be relocated so that the upgrading programs be implemented.

Public housings: there are different examples of public housings, both successful and unsuccessful. It is reported that the most successful cases are Singapore and Hong Kong. It should be noted that according to the World Bank report, both countries are rated as High income. Given that the annual budgets for public housing and similar projects are considered. Hence it can be considered as one of the essential factors in such project success. On the contrary, such opportunities are not available for developing countries.

Site and Services schemes: this type of housing development can be categorized as relocation but with two main approaches:

- *A plot with no house but infrastructure is provided.*

- *A plot with a core unit (e.g. one room) and a wet cell providing drinking water and basic sanitation*(UN-HABITAT, 2015).

As studies show, among the mentioned approaches, upgrading still is the best solution financially and culturally, though eviction and displacement are yet the significant response to slums in many countries. However, it brings up the question of why relocating peopl e cannot respond to this issue.

> *"Relocation is a useful tool of housing and urban policy but only if it is voluntary, such as when slum dwellers agree to relocate to a serviced plot as a consequence of the upgrading of their settlement, which may involve providing financial or other incentives such as free housing. For such residents, sites and services' schemes represent a desirable and feasible alternative, but issues of gentrification should be seriously minimized. As we shall see, slum upgrading remains the most financially and socially appropriate approach to addressing the challenge of existing slums"* (UN-HABITAT, 2015, p.15).

In the case of Beira, as the author studied the comments of people in social media(Facebook) about the selected site for people's relocation, the response was that people return to the low-quality houses that they used to live and to rent the facilitated homes which were prepared for them. The situation of people getting back to slums while offered housings with good services questions the efficiency of relocation in Beira regarding slums.

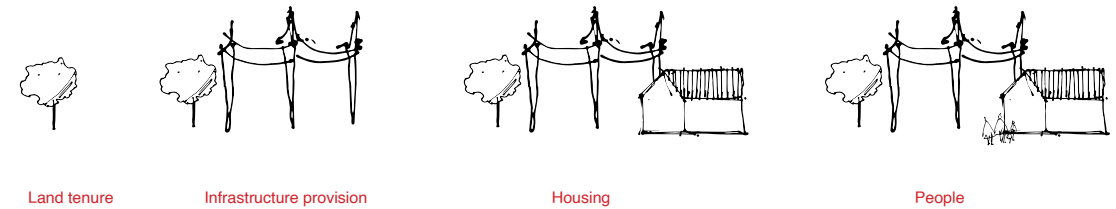**Reasons of eviction and relocation of slums**

Ref: Author
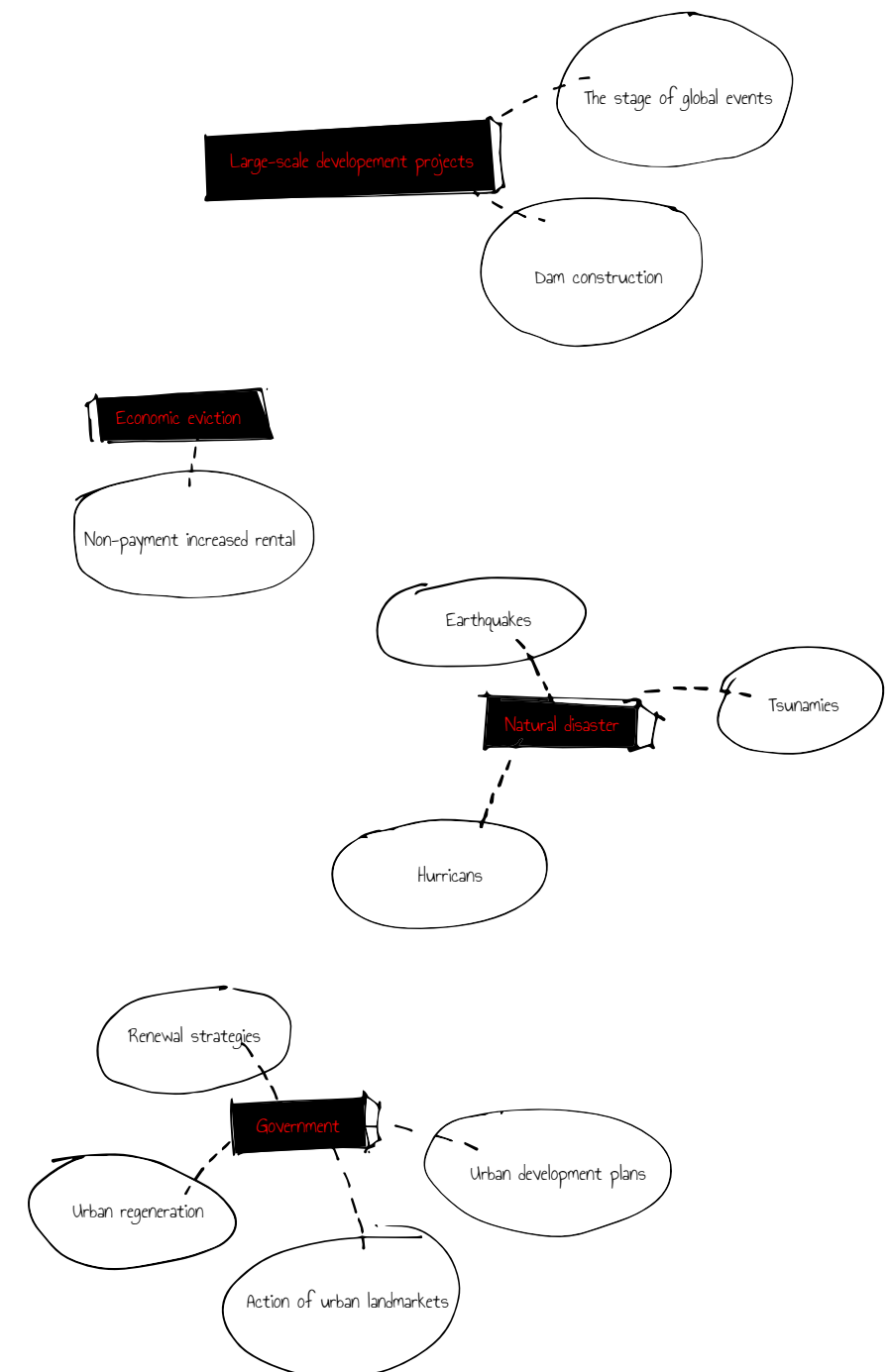
Upgrading

The primary definition of slum upgrading is the improvements in housing and/basic infrastructure in slum zones. In other words, upgrading also includes such improvements in economic and social processes that can bring physical enhancements as well.What UN-HABITAT mentions about upgrading is that it should consist of "*physical, social, economic, organizational and environmental improvements undertaken cooperatively and locally among citizens, community groups, businesses, and national governments and city authorities*"(UN-HABITAT, 2015, p.16).
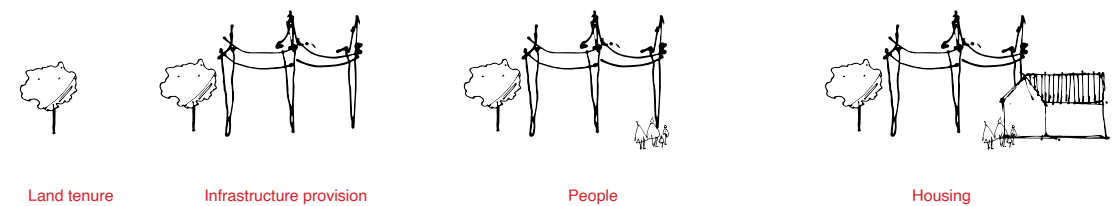
Typically, slums upgrading include the following list:

· regularization of security of tenure;

· relocation of and compensation for the residents (both men and women) dislocated by the improvements;

· housing improvement;

· construction or rehabilitation of community facilities such as nurseries, health posts, and community open spaces;

· improvement of access to health care, education, and social support programs to address issues of security, violence, substance abuse, et al.;

· removal or mitigation of environmental hazards;

· provision of incentives for community management and maintenance;

· enhancement of income-earning opportunities through training and micro-credits;

building of social capital and the institutional framework to sustain improvements

The sketch (p.54) describes different steps of upgrading. Depending on the study of each case, these sequences could be different. In the following chapters, the author tries to analyze the situation in Beira and study probable answers for its current issues.
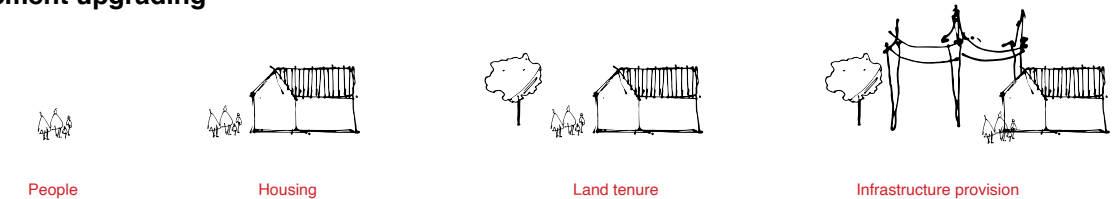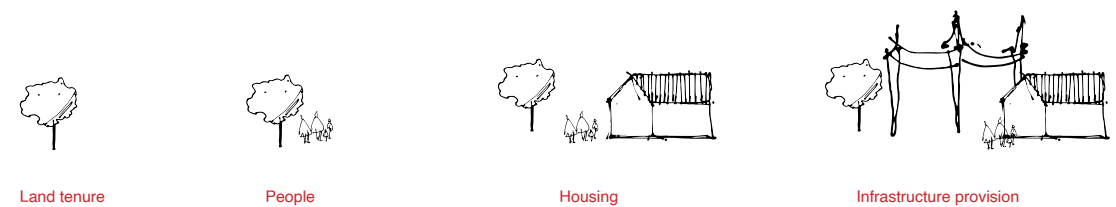
Conventional Housing programme

Land tenure   Infrastructure provision   Housing   People

Sites and services scheme

Land tenure   Infrastructure provision   People   Housing

Settlement upgrading

People   Housing   Land tenure   Infrastructure provision

Incremental developement scheme

Land tenure   People   Housing   Infrastructure provision

Logic of housing developmen

Different approaches

Ref: Redrawing of a scheme done by author based on UN-HABITAT (2015).

The value in upgrading demonstrates itself through financial and social aspects and costs to slums. Where government supports such upgrading, it can have an immense impact not just on slums but the government itself. For example, the plot size can be smaller, and they also can catalyze changes in official regulations to lower the cost of "formal" housing though it might not provide all the official rules for buildings(Satterthwaite et al., 2020).

It should be noted that one cannot expect that upgrading slums solve all the existing problems, but it can improve and enhance the overall condition for them.

Upgrading criteria

Upgrading has different levels of engagement, and depending on the project and site, this level varies. However, it should consider some criteria:

- A city vision should be not only ambitious but also realistic: **the Dakar Master Plan2025** is an example, "*2025 (Plan Directeur d'Urbanisme de Dakar à l'horizon 2025) that "aims to stop the anarchic occupation of the urban space, to address the urban transport problem and to tackle the challenge of slums". Likewise, in Callao, Peru, the Plan de Ordenamiento Territorial proposes to reduce social and spatial polarization with proper land management over the next 15 years.*" (UN-Habitat, 2008).

- It not only should be ambitious but also innovative

- A vision should also be attractive and focused. "Plan 1995" for Rio de Janeiro aimed "to become a metropolis with increasing quality of life, socially integrated, respectful of public life, and confirming its vocation for culture and *joie de vivre*"(UN-Habitat, 2008).

In conclusion, the author suggests that upgrading proposals and phases should get adapted to the locality of slums. The more the study be localized, updating approaches could function better.

Upgrading case studies

Some cities tried to combine climate-change adaptation and disaster risk reduction with development. Santa Fe83 is an example that included the flood-protection initiatives and land-use management in Durban in order to protect biodiversity and ecosystem services while supporting new livelihoods. Another approach is to use green and blue infrastructure to contribute to flood-water retention. In many cases, governments blame slums for environmental problems, but slums have proven how they are guardians of the environment. Surabaya and Bangkok are examples of such approaches by preventing disposal into rivers and canals. (Satterthwaite et al., 2020)

Another example is Turkey that, even though it had a different approach to slums like ignoring them or bulldozing over the past years, also has achieved new ways to deal with it by upgrading, systematically legitimizing self-built housing, and allowing in-situ upgrading. (UN-Habitat, 2008).

A slum upgrading project: Erzincan-Cars Quarter example, Before.

Ref: Uzun et al. 2010
https://www.semanticscholar.org/paper/Legalizing-and-upgrading-illegal-settlements-in-Uzun-%C3%87eted99bf16 8e7b36d8c67d91cea68fb20c 804d44fd9

A slum upgrading project: Erzincan-Cars Quarter example, After.

Ref: Uzun et al. 2010
https://www.semanticscholar.org/paper/Legalizing-and-upgrading-illegal-settlements-in-Uzun-%C3%87eted99bf16 8e7b36d8c67d91cea68fb20c 804d44fd9

The photos and maps(p.56) show the upgrading project in Guinea-Bissau, funded by the Netherlands governments and the government of Guinea-Bissau. The upgrading promoted the restructuring of the urban configuration of the neighborhoods as a way to trigger better accessibility, better flow of the rainwater drainage, and promote assisted self-help housing development processes. The approach was applied as a demonstration project in 3 neighborhoods of the city during the 1989-1992 period and later replicated in 11 different neighborhoods of the city (UN-Habitat, 2003).

Cupilom Before Street Making
UN-HABITAT(2015)

Cupilom After Street Making
Credit: Ruy Barbosa Pinto
UN-HABITAT(2015)

New street layout in Cupilom, showing houses to be demolished and rebuilt.
UN-HABITAT(2015)

New Street Layout in Cupilon Informal Settlement, Bissau, Guinea-Bissau
Yellow areas, show the buildings that were delomished Credit: Ruy Barbosa Pinto
UN-HABITAT(2015)

Planned and unplanned urban configurations
Lukasa, Zambia.
Ref: Google earth 2021

Kalingalinga informal settlement and sites & services resettlement area, Lusaka.
Ref: UN-HABITAT 2003
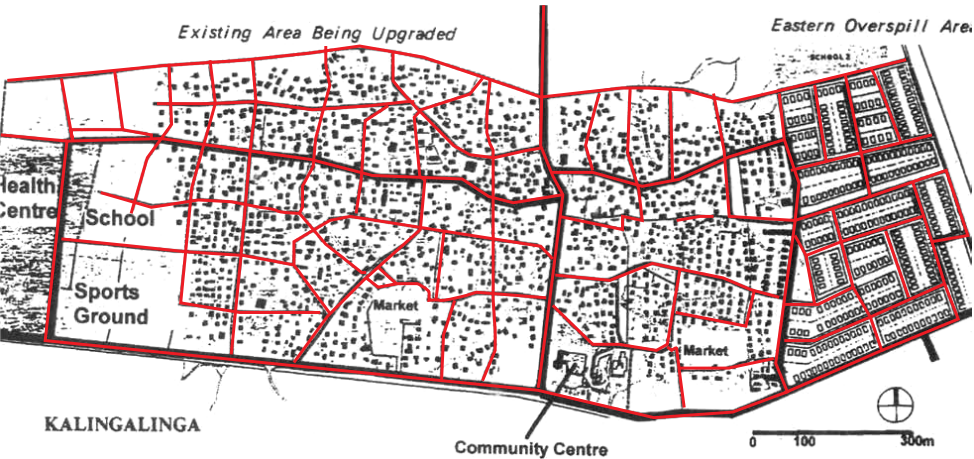
Lukasa is another example of upgrading with the site and services approach. It intended to provide services and housing improvement opportunities to circa 18,000 houses in Lusaka's three largest squatter complexes with

a population of 130,000 inhabitants in 1973. The upgrading of these settlements was combined with a sites & services area in order to allow for the

resettlement of households whose houses had to be demolished for the implementation of the upgrading plan. The success of the project generated a number of subsequent initiatives

and multi-year programs to improve the life of inhabitants of these settlements.

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Chapter 03

Beira

This chapter begins with a short introduction of the city through history. It follows the topics regarding their relation to the informal settlements in Beira.The author maps essential factors regarding new scenarios for the city and informal settlements. This chapter is mainly based on the students' report in Final Design Studio, Master of Sustainable Architecture, Politecnico di Torino, 2021.

High density informal settlements

High population density and a lack of access to basic services
Beira, Mozambique

Introduction

Beira is located in the fertile lowlands of central Mozambique along the strait of Madagascar. It is a coastal port city, the regional capital of the central Sofala province, and a key logistical hub in the broader Beira corridor. Located in low-lying marshlands between the Pungwe River estuary and the Indian Ocean, urban flooding is a recurrent feature in Beira brought on by tropical storms and seasonal overflow during the rainy season and turning vast sections of the municipality's territory into wetlands(Shannon et al., 2021). Ancient African cultures shaped Beira. The city became one of Portugal's colonies from **1498 to 1975**.

Beira's independence in 1975 was followed by a 15-year civil war (1977-1992) that contributed to poverty and inequality. Since then, multiple social, economic, and climate threats have evolved in Beira's already vulnerable economy. (GSAPP, 2020)The city has experienced degradation of its natural capital, transforming the dune and its estuary, where the city was initially settled into a low-density, vast urban sprawl. It forms part of the Beira Corridor, a strategic agricultural and logistical corridor that links Zimbabwe, Zambia, and Malawi, providing food and other primary products to landlocked countries in East Africa.

In the early 20th century, the Portuguese created the leading seaport in Beira and a railway to Rhodesia. This infrastructure was developed on top of Beira's sandbar, denying its natural capital. The city was a significant hub in East Africa that included tourism, fishing, and trading activities. It has experienced rapid population growth escalating from 41,000 inhabitants in 1945 to 556,000 in 2019, with an expected increase of 250,000 residents by 2030(p.73,74).

The flooding of 2000 damaged most of Beira and its economy. In **2019** the cyclone **Idai** arrived, Beira was extremely devastated, and the economy decreased (Wang et al.,2021). Moreover, the last tropical cyclone **Elise in February 2021**, brought another wave of destructions even though it was not as destructive as **Idai Cyclone** but hit the city noticeably.

Mozambique map

website: https://data2.unhcr.org/en/documents/details/80421
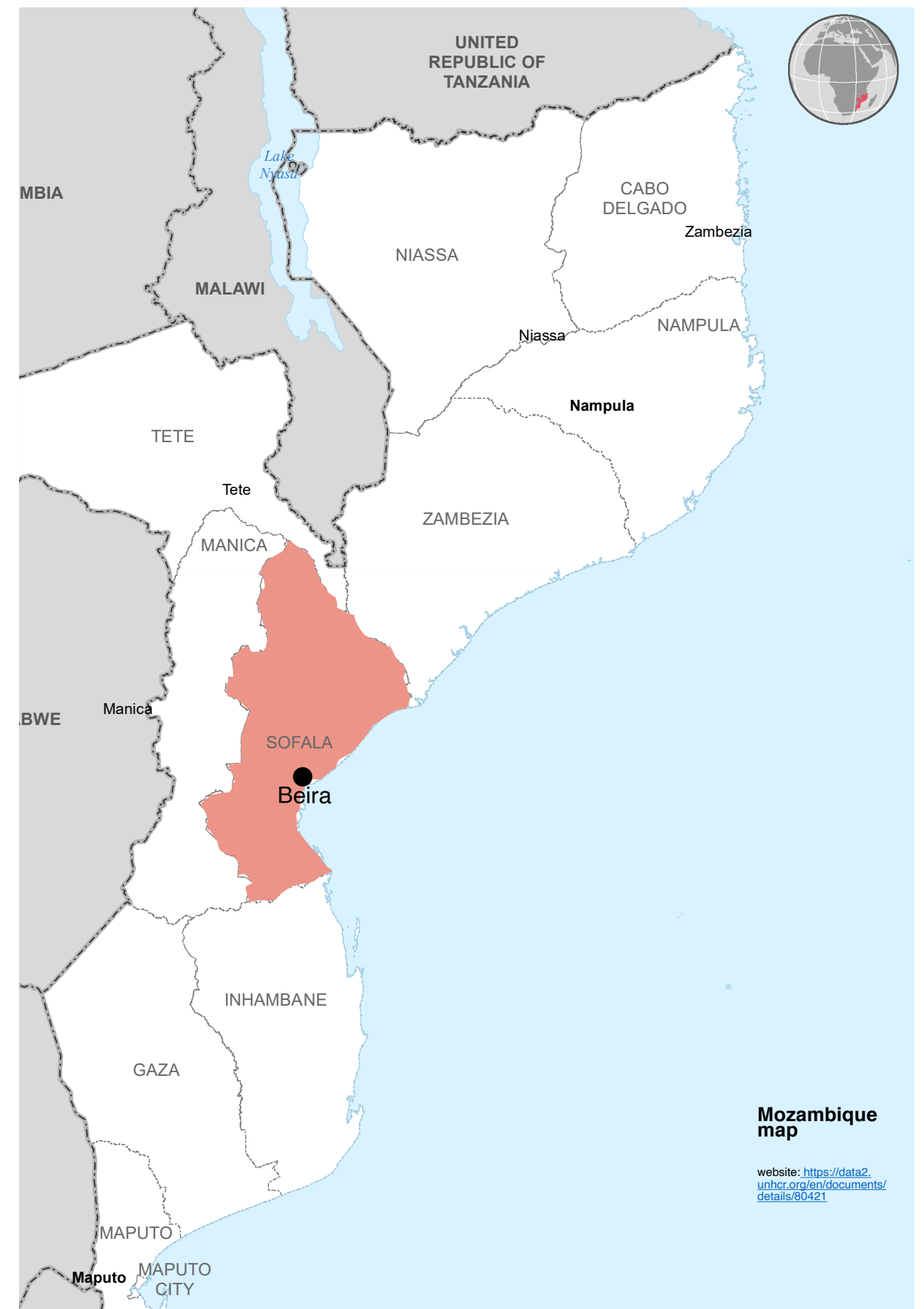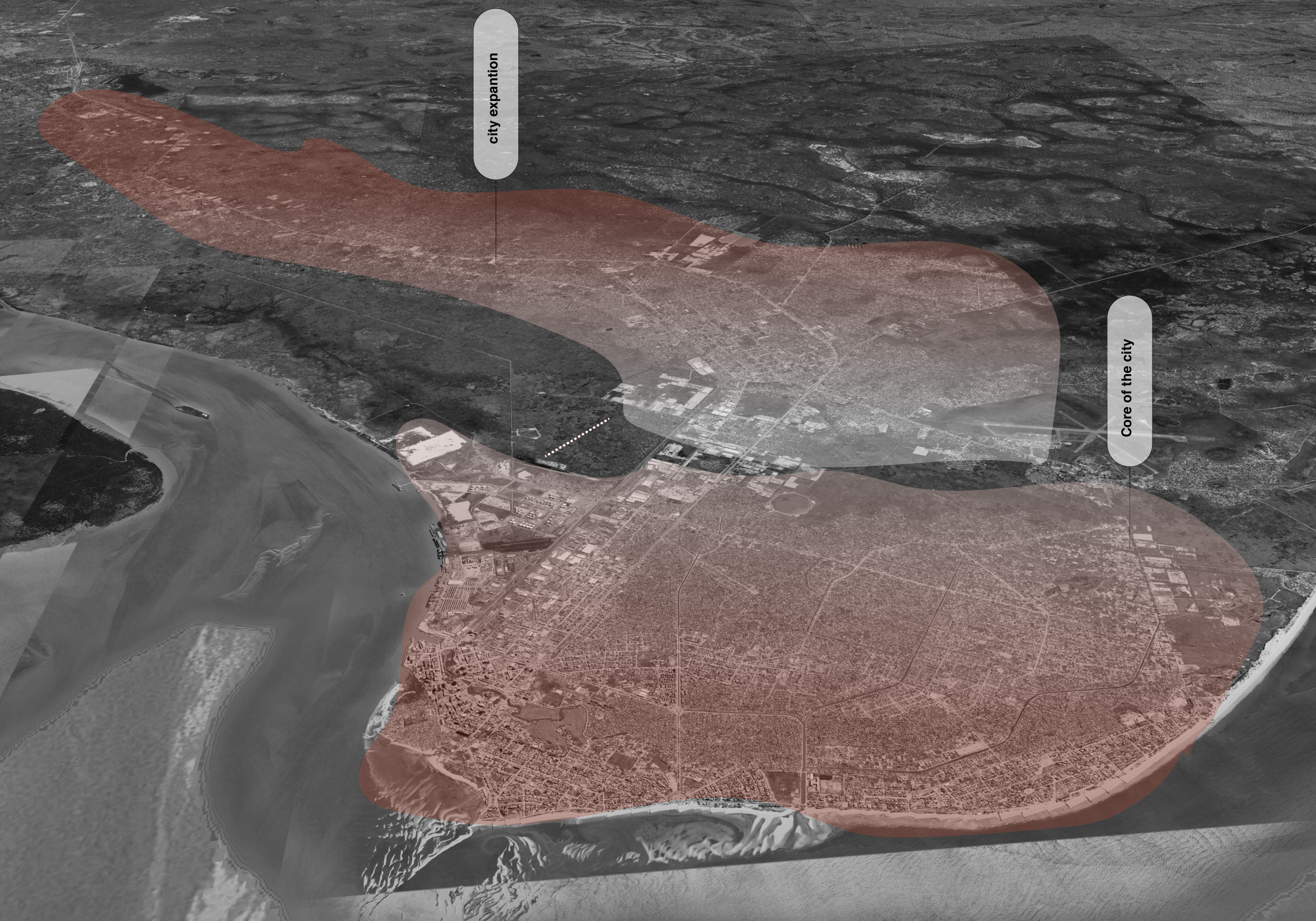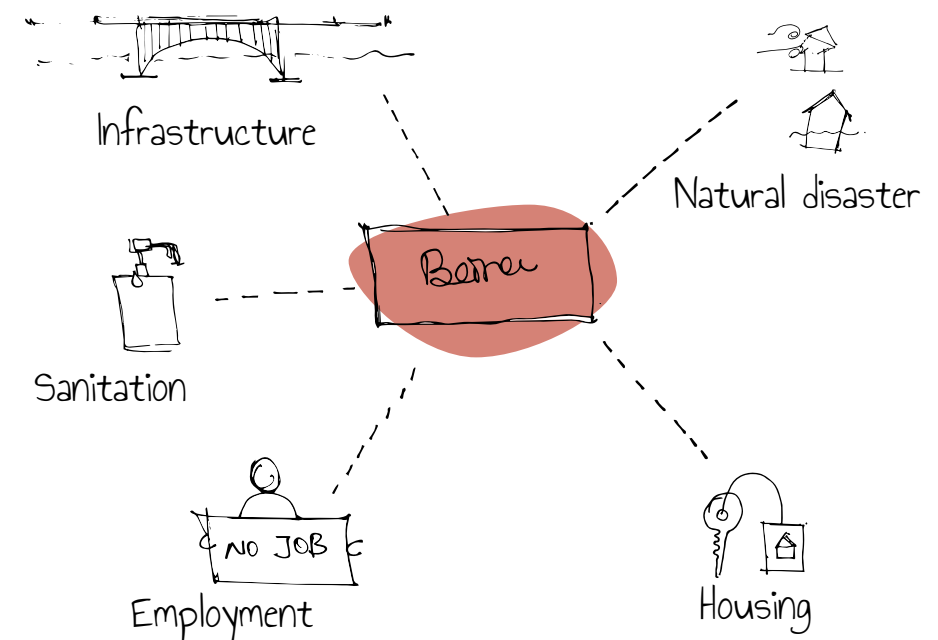
city expantion

Core of the city

The city

Formal and informal urbanization

Like other cities in Mozambique at the time, urban governance consisted of a racist dual governance regime, which translated into two distinct socio-spatial categories known as the cement city and the cane city. The **cement city** was the city of colonial settlers or wealthy part of the city, built on reclaimed marshland and planned as a Portuguese resort town that fell under the colonial administration. On the other hand, **the cane city** that belonged to the Mozambican population comprised settlements governed by customary chiefs and without any access to colonial infrastructures (Shannon et al., 2021).

The urbanization process took place in two different ways in Beira. The formal urbanization directly relates to the traffic **infrastructure of the ring road style** created by the Portuguese. The informal settlements are located mainly in the **swamps and occupy a significant portion of the city** (almost 80% of the current population. Informal settlements have become densely populated with the rapid population growth. Houses in these places are built with materials mainly found in the trash. People live in precarious conditions. These settlements are related to the **economy**.
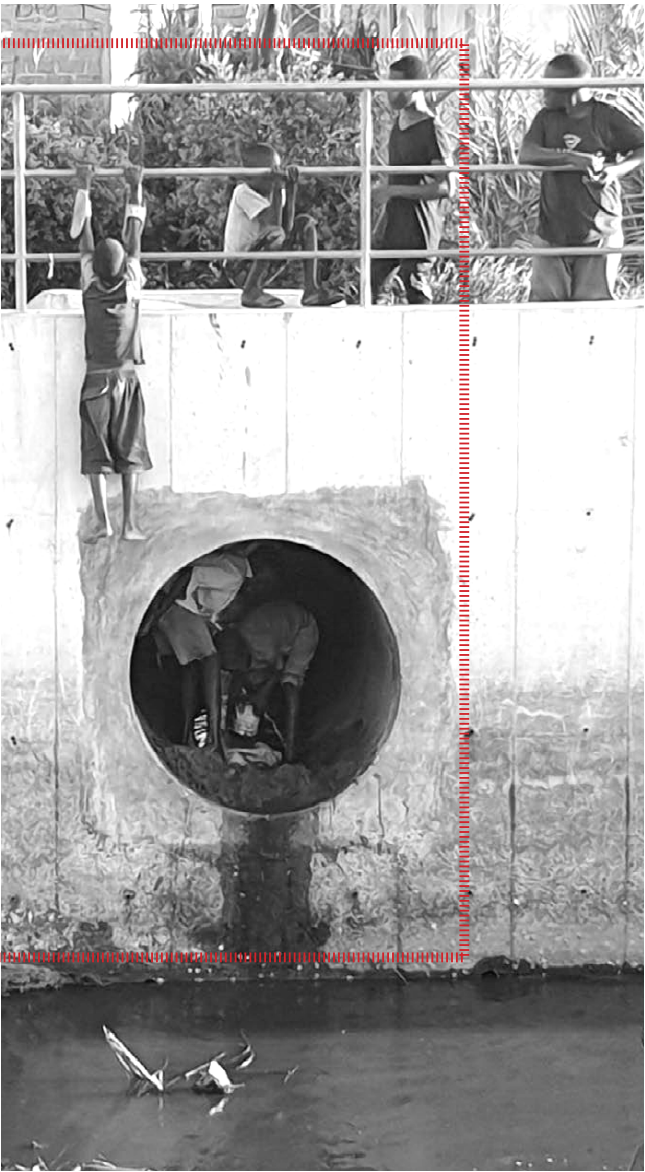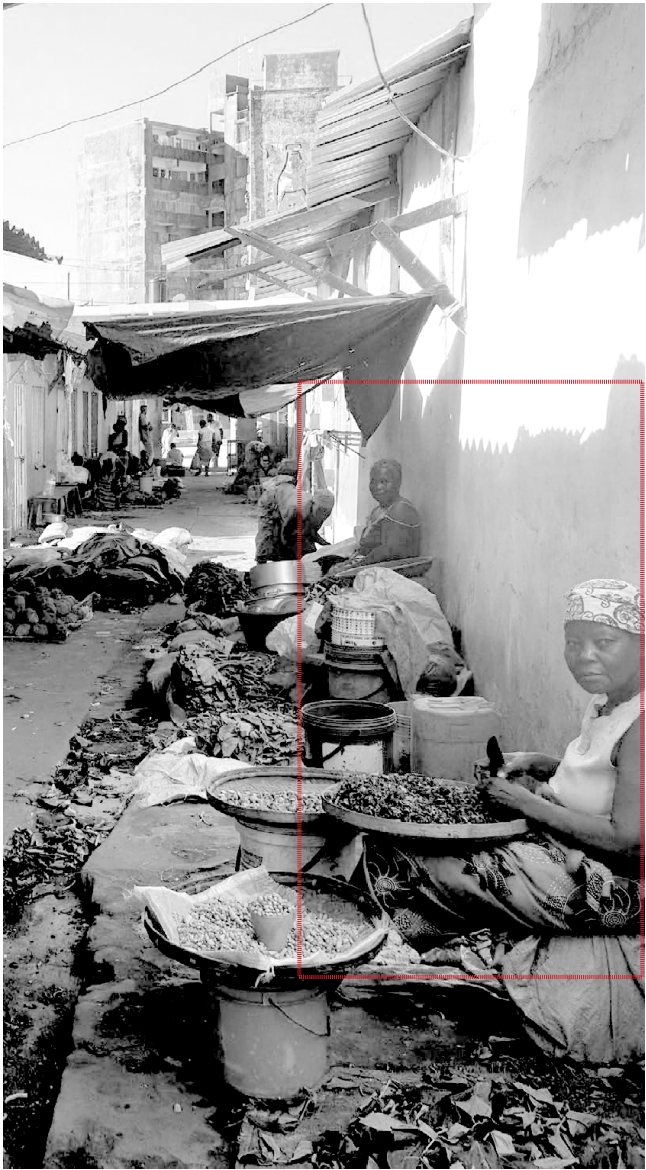
Infrastructure

Natural disaster

Sanitation

Beira

Employment

NO JOB

Housing

Main issues in Beira

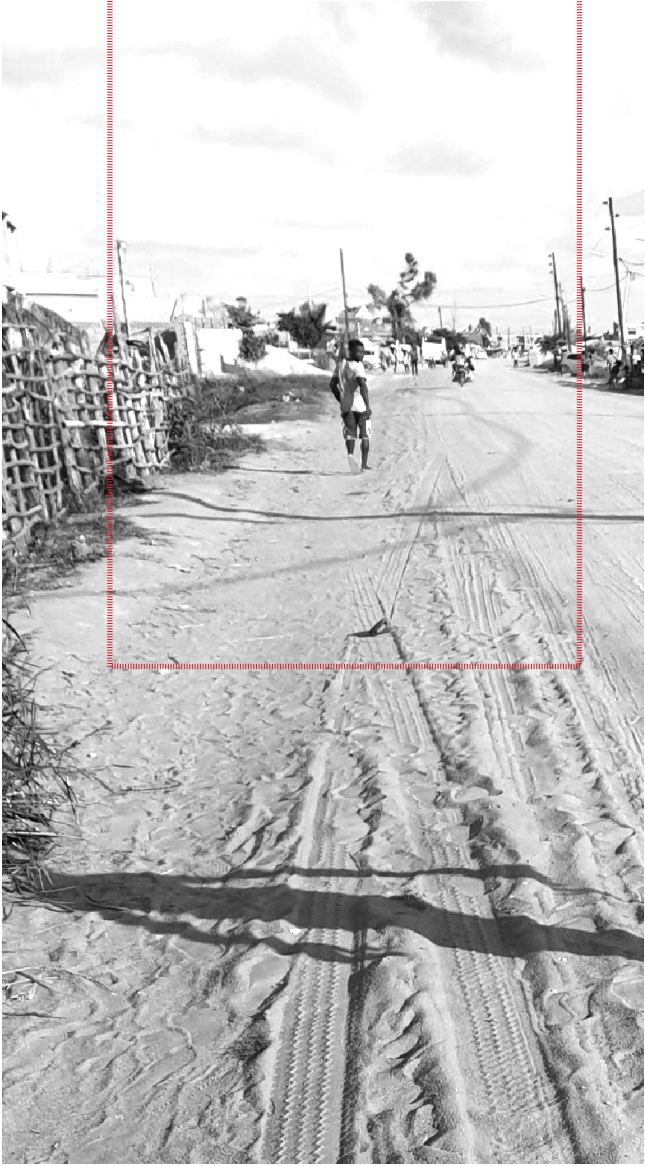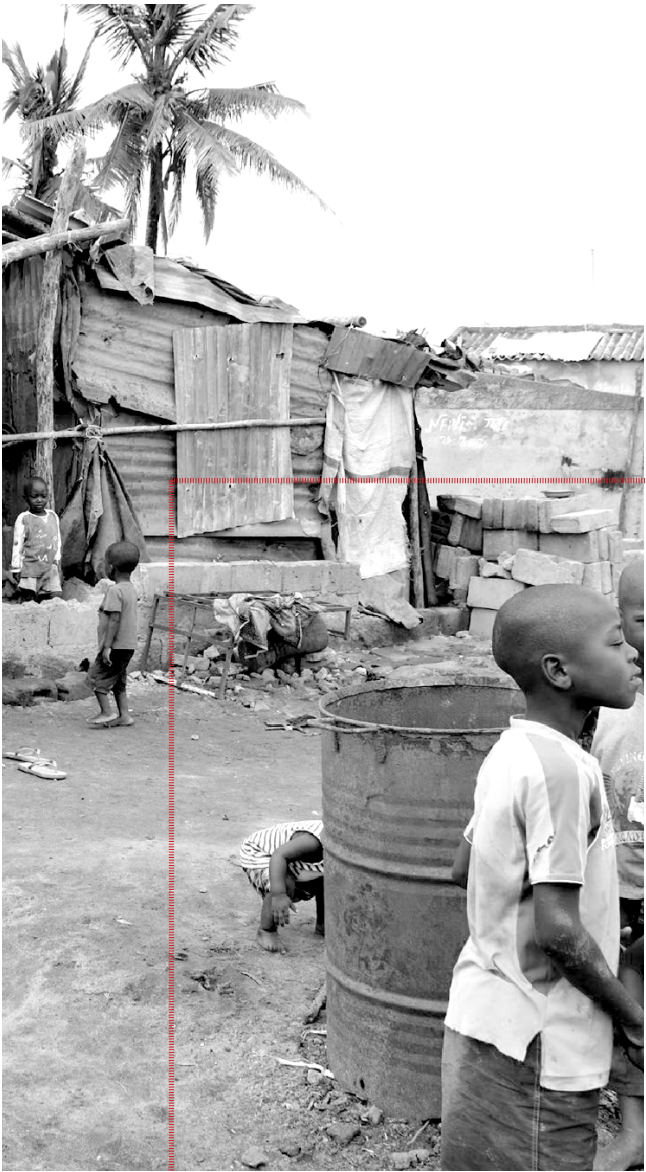Ref:authot

Beira in a glance

Poor infrastructure and lack of public facilities

The importance of streets and the role of women in the city

Housing crisis

Quality of streets

There will never be enough money or time to do all the necessary items if we try to do them separately. More localized design strategies can simultaneously manage stormwater, improve housing quality, mitigate pollution, ensure water and food security, and provide opportunities for more robust local livelihoods. Social capital enables communities to create their adaptation strategies. Displacing communities threatens valuable social networks, squandering social resilience.

CIDADE DA BEIRA
PROJECTO DE URBANIZAÇÃO

VISTA GERAL

SOCIEDADE PORTUGUESA DE FOMENTO

CIDADE DA BEIRA
PROJECTO DE URBANIZAÇÃO

The urban design Beira,1943 for future overlapped with current situation

The urban plan by Ribeiro Alegre e Jose Porto. Source:https://delagoabayworld. wordpress. com/2018/05/16/o- plano-de- urbanizacaõ-da-cidade- da- beira-1943/

and google earth
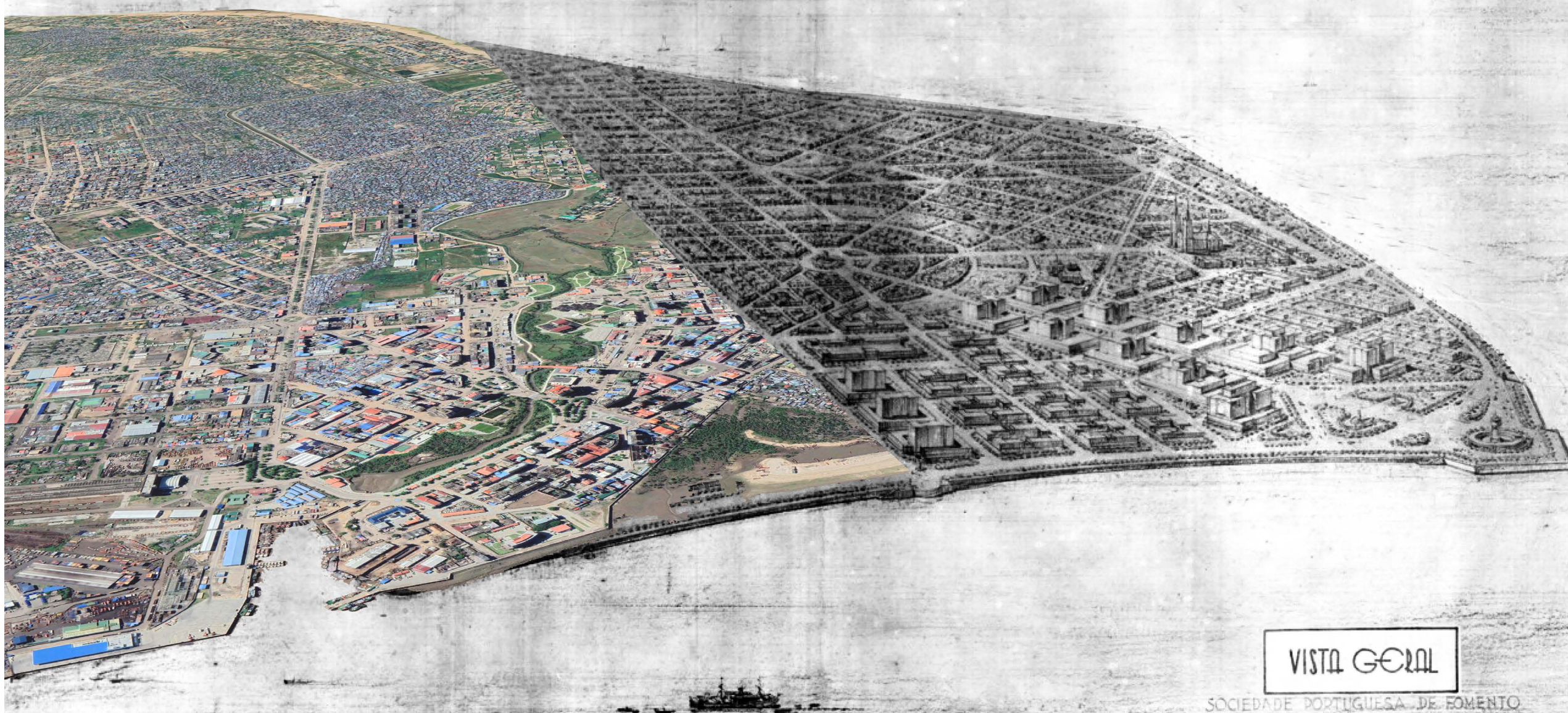
VISTA GERAL

SOCIEDADE PORTUGUESA DE FOMENTO

EST. III — O núcleo de maior concentração de actividades económicas.

Economic center, Beira

Amaral,1969

EST. IV — Aspecto do porto da Beira.

Port of Beira

Amaral,1969

EST. VIII — Instalações do caminho de ferro e do porto da Beira.

**Railway and port
facilities1969**

Amaral,1969

**Railway and port
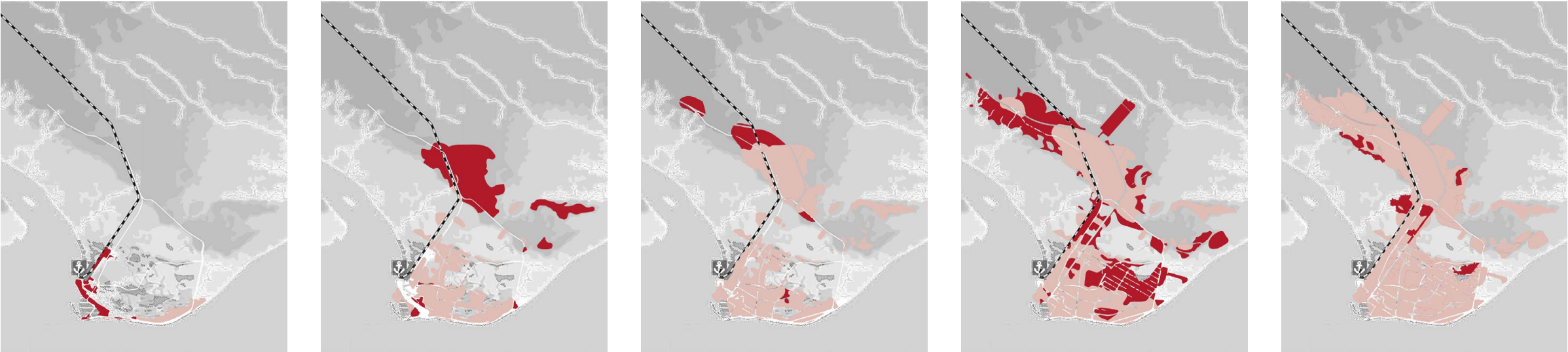facilities,2019**

google earth

Beira's Urban Growth Timeline

Redraw
Refrences: The world bank,
UN- Habitat

The timeline clearly depicts
the importance of edges as
the first reachable area for
slums to occupy.

Total population
(in thousands)

Population in infor-
mal settelemnts(%)

Year

| 1942 | 1975 | 1990 | 2015 | 2019 |

41 — 140 — 314 — 511 — 556

68% — 70% — 75.6% — 76.7% — 78%
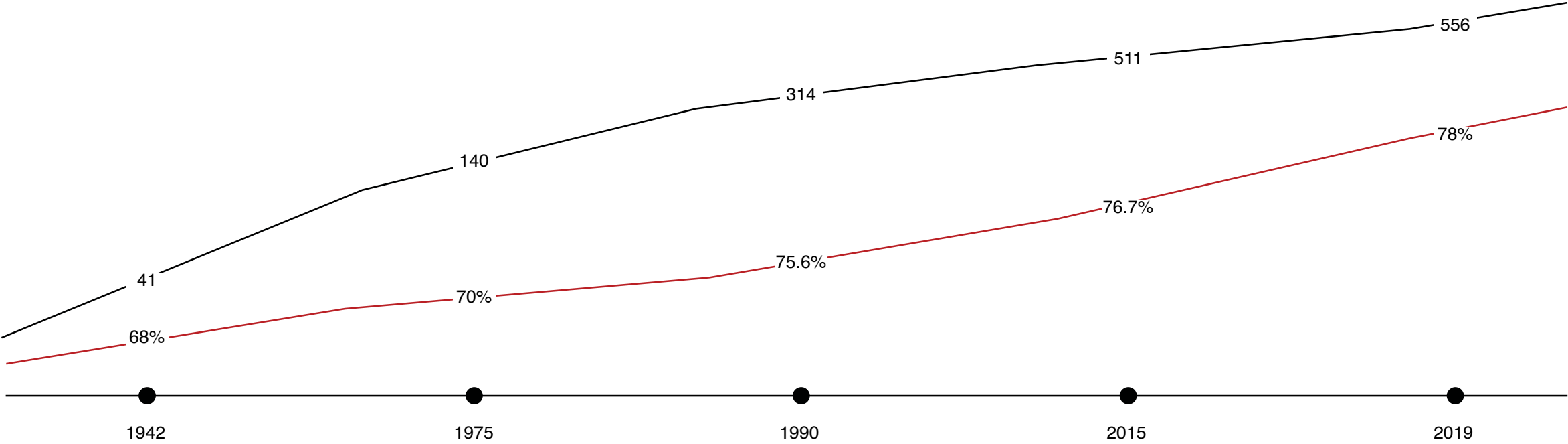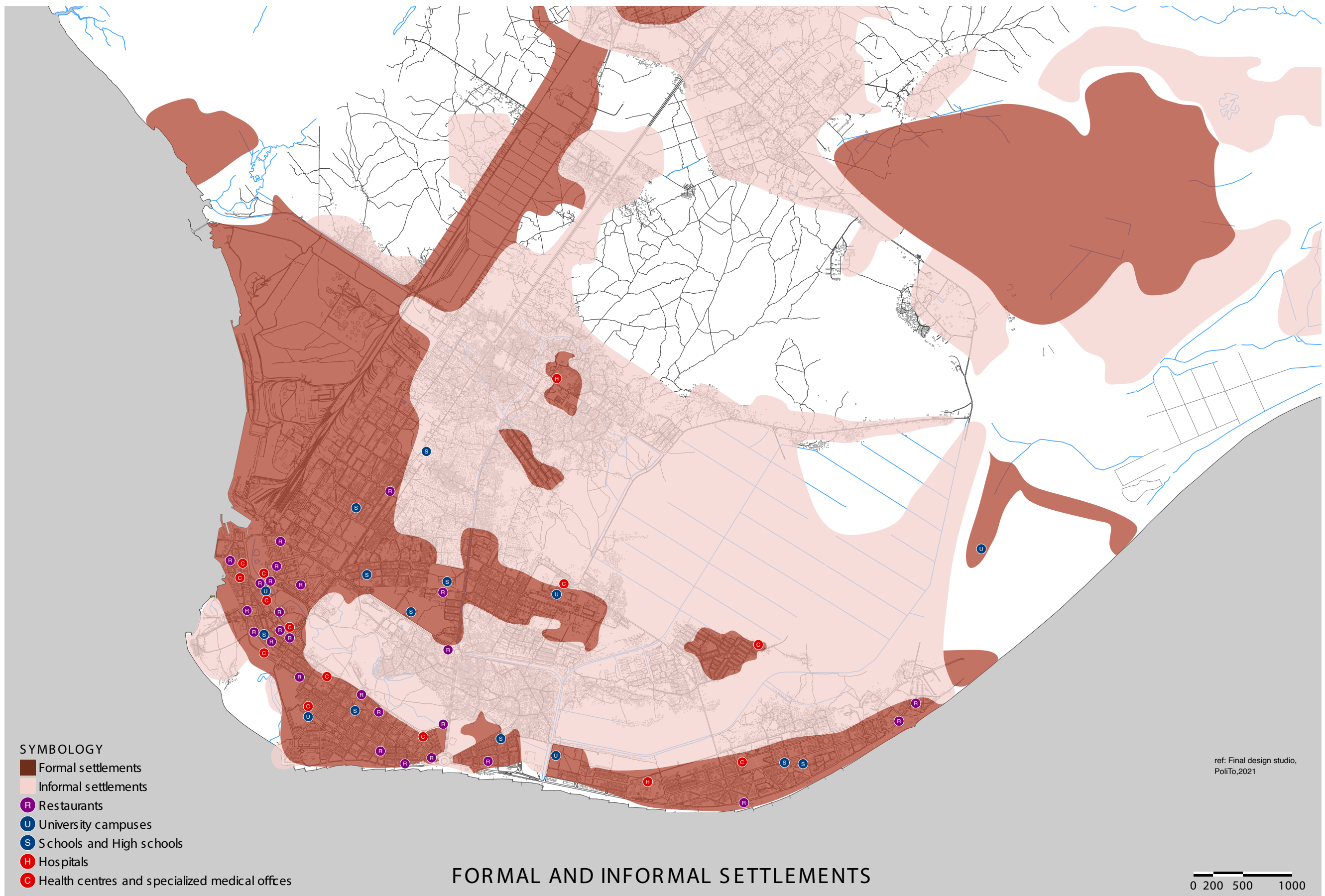
SYMBOLOGY

- Formal settlements
- Informal settlements
- Ⓡ Restaurants
- Ⓤ University campuses
- Ⓢ Schools and High schools
- Ⓗ Hospitals
- Ⓒ Health centres and specialized medical offices

ref: Final design studio,
PoliTo,2021

FORMAL AND INFORMAL SETTLEMENTS

0 200 500   1000

Economy and jobs

Mozambique has the sixth-lowest Gross Domestic Product per capita (GDP per capita) in the world. It also has the fourth-lowest Gross National Income per capita (GNI per capita) (Wang et al.,2021)

Urban agriculture is widely practiced throughout the city. It is heavily concentrated in several wetland green zones within the city that has been naturally protected from competing for land uses by frequent inundation. Urban agriculture **is a women-led institution** and is generally practiced and other livelihood activities, such as informal entrepreneurship and domestic work. **Rice** is the primary crop grown in these agricultural green zones, sometimes rotated with sweet potatoes during the dry season. Urban agriculture can be traced back to the initial establishment of Beira city in the late 19th century under the rule of the Mozambique Company (MC), a private charter company that had concessions to central Mozambique under Portuguese colonial occupation. (Shannon et al., 2021)

Employment and Job categories

The unemployment rate in Mozambique is considered high, with 20% of people of working age being unemployed. The formal economy is urban mainly in nature and accounts for only 32% of all employment.

As a result, many new entrants into the labor market focus on marginal jobs in the informal economy, both in rural and urban areas, with little prospect of reliable employment.(Wang et al.,2021) The agriculture and fisheries sectors' share of GDP stood at 24.9% in 2016, compared to 20.1% in 2000. It employs the country's workforce (74.6%, 2015) and is marked by low-productivity subsistence-type production patterns and limited value chains. The country is a net food importer, with 5% of total imports in 2016. Main cash crops are tobacco, banana, cashew, and cotton.

Women and agriculture

A WFP-supported community farm in Mafambisse — one year after the cyclone, women are at the centre of efforts to rebuild livelihoods. © WFP/ Déborah Nguyen

Informal Jobs

In Mozambique, not everyone has a formal job. Informal businesses make up a large segment of businesses operating in many developing economies. **Mozambique is on the higher end of informality when compared to other countries in the region**. In the three cities surveyed(Maputo, Beira, and Nampula), only 1 in 10 businesses are registered with authorities. (Wang et al.,2021)Informal businesses are the primary source of employment in multiple developing countries. Moreover, they are considered as predominant ones. In particular, in Beira, there is one informal business for every five working-age individuals.

Informal business owners are among the hardest hit during crises like the Covid-19 epidemic. Even in regular times, given the limited income produced by their activities, owners of informal businesses live on their daily earnings. Their livelihood depends critically on being able to run their businesses daily. In terms of this dependency, Beira has comparable numbers with Maputo (capital of Mozambique), whereas Nampula has a higher dependency. Most often, for people and families engaged in informal business, this is their only source of livelihood. It is a very uncertain way of doing business, critically depending on running it daily and are more affected than formal ones during a crisis such as the Cyclone Idai in 2019 and the Covid-19 crisis of this year.

A typical informal business owner lives in a household with five family members, and it is clear how critical informal businesses are as a means of livelihood for a considerable portion of the population in Beira. Formal institutions do not recognize individuals working in these businesses, hence lack access to social safety nets that employees in the formal sector enjoy. Further, the low level of earnings in these businesses means that people living on income from informal businesses are pretty vulnerable.

Covid-19 and its effects on Mozambique's economy

As a country with a high unemployment rate, equal to 20%, in Mozambique, 1 out of every five persons are unemployed. This situation became worse with the arrival of the pandemic. In the province of Sofala, more than 2.000 jobs were affected, and 65 companies announced the possibility of closing.

A man carries the day's catch from the harbour to the municipal fish market in Beira, Mozambique

July 2001. Image scanned from the original negative.
Photo by Leonie Marinovich
A

A local street market in Beira

bristolbeiralink.org/appeal-for- funds
May 2020

Low-Cost Resilient Houses

After centuries of colonial rule followed by years of war, Mozambique is also one of the poorest countries in the world, and more than half of residents live below the poverty line, with few resources to prepare for storms. (Wang et al.,2021) During the cyclone Idai, Beira, a city of a half-million people, was hit by 100 miles an hour winds and more than 170mm of rain (other areas saw more than two feet of rain, or almost as much as the region would typically get in a year). People typically build their own homes from the cheapest materials available. "They will use whatever means they have to build their house," says Casimiro António, co-founder of the Arman Group, a Mozambique-based sustainable development consultancy, who previously worked with the development agency USAID.

Abandoned houses were nationalized in 1975, and those left vacant by Portuguese nationals were given to homeless Mozambicans. The rental property was also nationalized. In most rural areas, people live in mud-walled and thatch-roofed houses that they construct themselves. Though often circular, some are square. Square or rectangular housing is most common in urban and peri-urban

neighborhoods. Mud and wattle construction (where mud is held in place by a frame of crisscrossed sticks) is widely used in rural areas, while in and near urban areas, people more often utilize cement bricks. Most rural and urban areas are relatively small, built-in clusters around a typical yard where most cooking and food preparation occur. (Wang et al.,2021)

Outdoor activities typology

Shaping Mozambican cities, Outdoor Domestic Space is resilient because it is able to adapt domestic space to new(agro and non-agro) productive functions as a strategy to secure livelihoods (food and income) and produce a comfortable and clean domestic microclimate in the neighborhoods (shade and fresh air). (p.92,93)

Neighborhood analysis

As discussed before, Beira has two different prominent neighborhoods: cement city and cane city; the following drawings demonstrate the differences in these two neighborhoods.

High acquisitive power neighbourhood

Based on: Ton Dassen, PBL and Nam Quan "Cities as agents of change?".
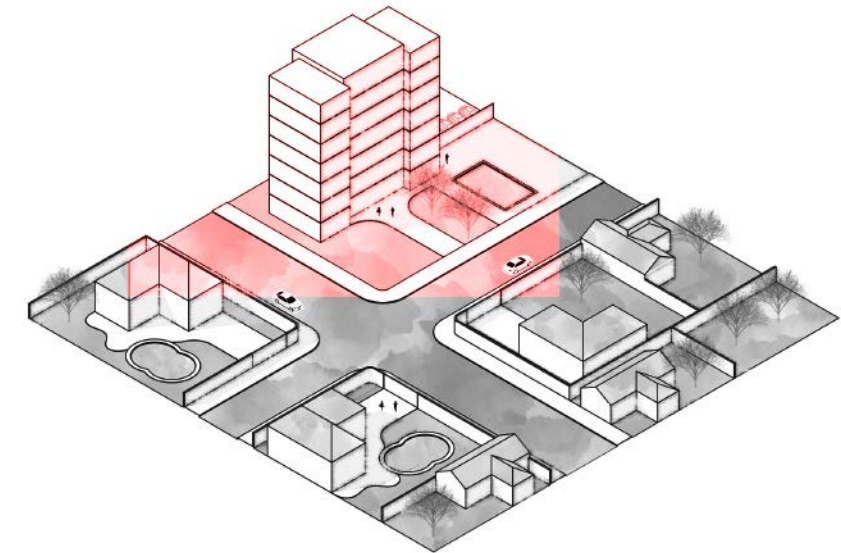
Ref:(Wang et al.,2021)

Low acquisitive power neighbourhood

Based on: Ton Dassen, PBL and Nam Quan "Cities as agents of change?".

Ref: (Wang et al.,2021)
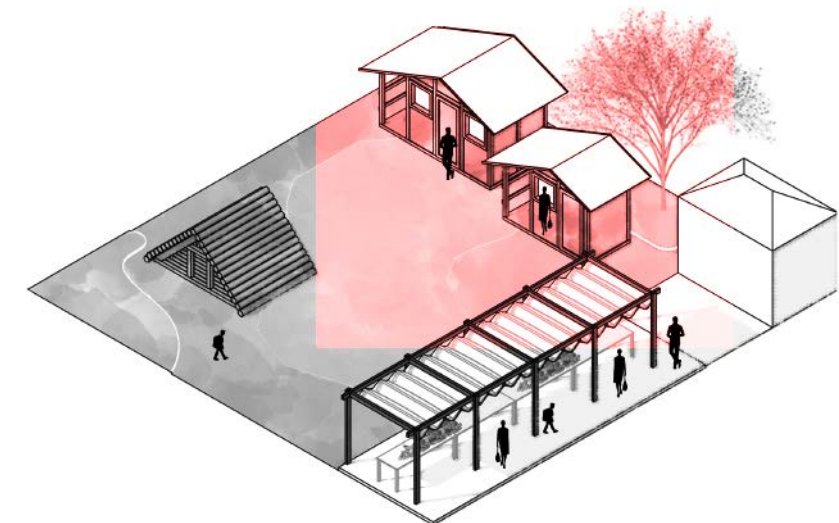
Peri-urban neighborhood   Sub-urban neighborhood   Urban neighborhood

Bathroom

Multifunctional outdoor domestic space

Entrance

Store
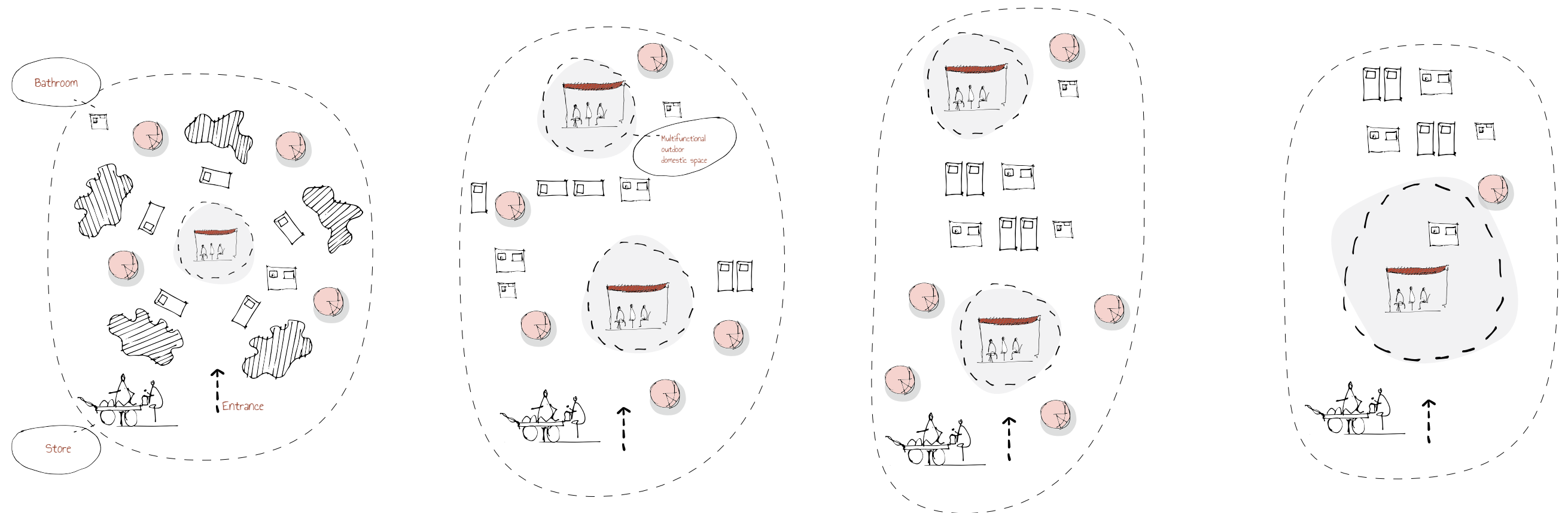
**Outdoor
Domestic Space
Transformation
and Livelihood
Self-
Organisation in
Spontaneous
Neighbourhood**

Céline Veríssimo, 2009
redrawn by author

Cement city or formal settlements are located in the former Portuguese city. Here the streets count with sanitary systems; most of them are made of concrete or asphalt. In this part of the city, we can find some tall buildings, but the formal city is mainly composed of villas. Here the streets count with sanitary systems; most of them are made of concrete or asphalt. In this part of the city, we can find some tall buildings, but the formal city is mainly composed of villas.

Cane city is where informal settlements exist, and they are mainly Mozambican. The informal settlements in Beira or slums are widely distributed; they surpass formal settlements in number. Here the streets do not count with sanitary systems. Most of them are made of earth and mud and do not follow any type of organization. In this part of the city, we often find houses made by its inhabitants with poor materials.

Studying the general fabric of the city demonstrates the importance of streets in defining the quality of the neighborhood in the first approach.

The slums are crammed with struggles for their inhabitants. Services are almost non-existent. An example of this is that in many places, people live in between their trash. When it is already piled up, they take it by themselves to the district's edge to be picked up by the city(Wang et al.,2021) The streets in this part of the city are filled with markets. The people who work here try to sell their goods but buyers often complain about the high prices of food. The market stands for lack of good sanitary conditions; some of the food being sold is washed in dirty water, without refrigeration, and in contact with flies and other animals. Most kids here start to work on the markets at a pretty young age to help their parents with the family expenses. With Covid-19, the current situation is worse than usual. Masks are mandatory, but almost no one follows the rule, also sales have decreased for most people.

Usually, people who live in rural areas work in agriculture. Those lucky enough to own some land can work their land and hire some neighbors.

Mayor's market visit, Beira
Ref: https://bristolbeiralink.org/appeal-for-funds/

Poor access to potable water, Beira
Ref: https://bristolbeiralink.org/appeal-for-funds/

Climate

Beira is the coastal capital of Mozambique's central Sofala province, home to more than 500,000 citizens and often described as Mozambique's 'second most important city after the capital Maputo. It is located on the Mozambique Channel, an arm of the Indian Ocean located between Madagascar and Mozambique. (Tang et al.,2021)

It is estimated that over 70% of Beira's population and its surroundings participate to some extent in the agricultural sector. Historical intensive activity in the harbor area, related to coal mining and navigation traffic, associated with the 1977–1992 civil war, may have introduced anthropogenic pollution in the city. Therefore due to the absence of industrial contamination, most of the land is suitable for agricultural produce. The degradation of the city buildings, the disorganized housing of the suburbs, and the poor sanitary and environmental conditions cause a growing concern by the authorities and this study.

Land cover map

The analytical land coverage map is obtained from a Research paper by Jose Tomas Oliveira. Retrieved October 08, 2020, from shorturl.at/rvzHW
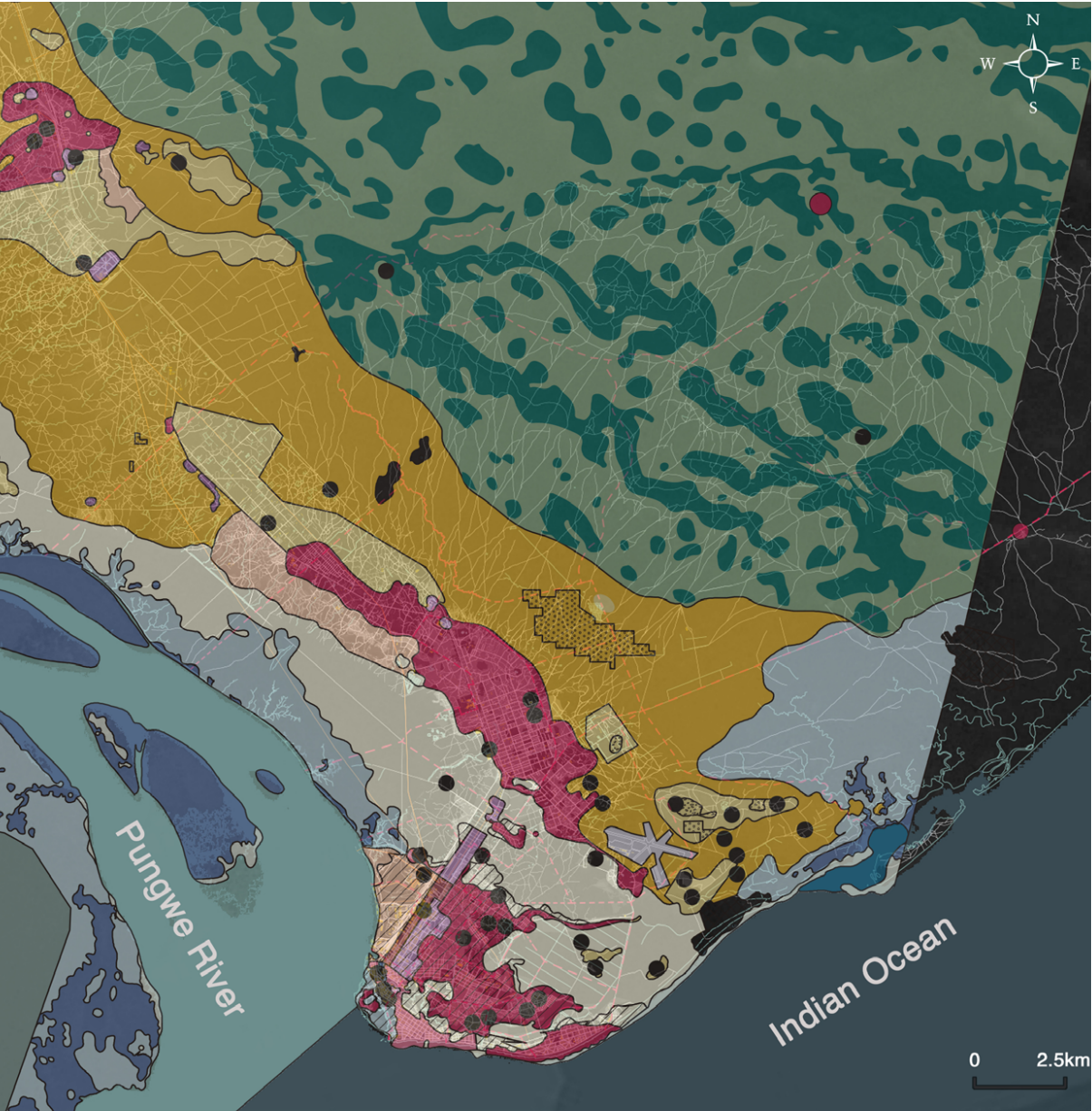
Artificial areas

111 Continuous urban fabric	0.3
112 Discontinuous urban fabric	4.5
121 Industrial or commercial unit	0.4
122 Road and rail networks and associated land	0.1
123 Port areas	0.4
124 Airports	0.2
131 Mineral extraction sites	< 0.1
141 Green urban areas	< 0.1
142 Sport and leisure facilities	< 0.1

Wetland,salt

411 Inland marshes	6.4
424 Mangrove	3.5

Water

511 Water courses	< 0.1
512 Water bodies	< 0.1
521 Coastal lagoons	0.3
522 Estuaries	8.4
523 Sea and Oceans	5.8

Agricultural areas

211 Non-irrigated arable land	6.7
212 Permanently irrigated land	< 0.1
213 Rice fields	0.1
222 Fruit trees	< 0.1
242 Complex cultural systems	3.7
243 Agriculture areas with natural important spaces	16.1
244 Agro-forest areas	1.1

Forest and natural areas

321 Natural grassland	26.6
324 Transitional woodland-shrub	13.3
331 Beaches, dunes, and sand plains	0.4
333 Sparsely vegetated areas	1.5
334 Burnt areas	0.1

Landfill   Fish breeding   Duplicate sampling sites

Stream   Pond   Sand exploitation   Sampling sites

Flood prone areas vs. Habitable built areas

Given that for future expansion and resettlement, the land available in Beira is minimal, most of the unutilized land bordering the coast is at high risk for flooding. Therefore, the majority of expansion should be directed inland along the highway, EN6, or by increasing the density of existing built-up areas. Of these current residents, 40 percent live in flood zones; 70 percent live in housing that is substandard in at least one major aspect of construction; 25 percent do not have access to solid waste management services; 60 percent do not have regular access to quality energy sources; 45 percent (and likely more) do not have access to a consistent and quality source of water, and an estimated 45 percent dispose of human waste in a way poses a threat to public health.

In the City of Beira specifically, parts of the informal townships in Chaimite, Munhava, Matacuane, Macurungo, Chipangara, and Chota are already up to 10 meters below sea level. (Tang et al.,2021) They are also where some of the cities' most vulnerable and poorest inhabitants live. People in these townships live under the constant threat of flooding, mainly during the rainy season.

Lands vulnutbality to flooding
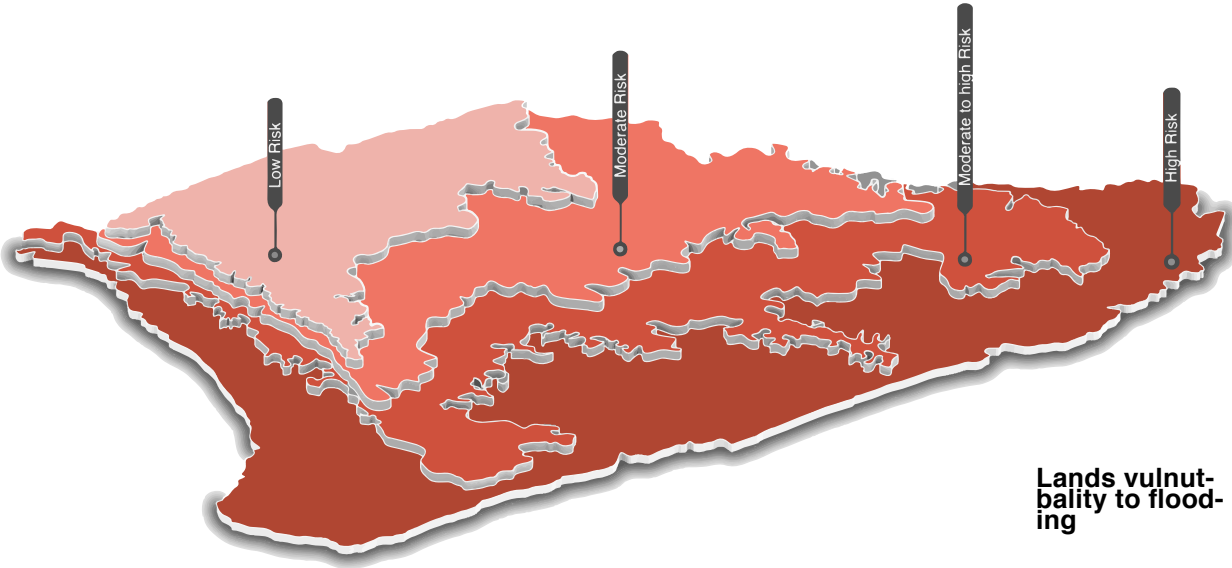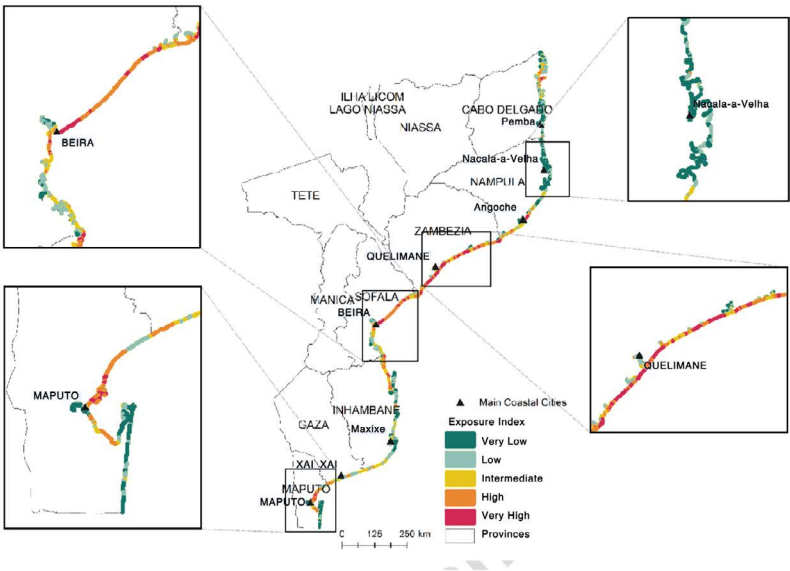
Ref: (Tang et al.,2021)

Lands vulnutbality to flooding

Ref: (Tang et al.,2021)

Understanding of the Climate Pattern

The climate in Beira can be characterized as both a tropical wet and dry savannah climate with rainy seasons from December to March.

Sea level rise and coastal erosion

The city's coastal area is currently below sea water level complicating the drainage and increasing the flood risk during the rainy season. The ocean level is rising, extreme weather is becoming more frequent, and the dunes that protect the city are eroded. (Tang et al.,2021)

Cyclone Idai

Tropical Cyclone Idai made landfall a category four Cyclone near Beira City (population 500,000) on March 14, 2019. Idai brought strong winds (180 – 220 km per hour) and heavy rain (more than 200 mm in 24 hours) across Sofala, Manica, Zambezia, Tete, and Inhambane provinces. An estimated 3,000 sq. km of land was reportedly affected by flooding, with over 715,000 hectares of crop fields underwater. The United Nations estimated that Cyclone Idai and subsequent flooding destroyed more than $773 million in buildings, infrastructure, and crops. More than 100,000 homes were damaged or destroyed.

Impact on the natural and built environment

The heavy rains caused significant damage to mud walls, whether the mud was used to render on a wooden structure filled with stones or an infill element in and on wooden cages or panels. The rains caused the disintegration of the earth-based elements, sometimes leading to the collapse of the structures themselves. The high winds have primarily affected roofing and tended to have completely removed the CGI covering. The materials removed from the roof caused significant damage to other houses and injured people. In some urban neighborhoods, most of the damage to the structure of concrete block houses was caused by fallen coconut or mango trees.

Temperature
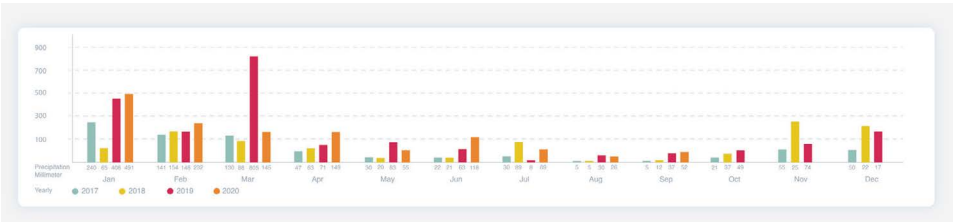

Maximum Temperature Yearly
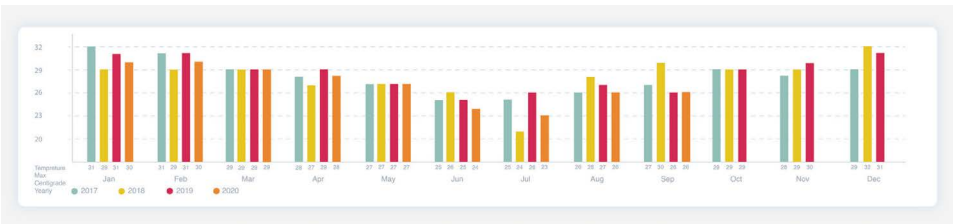
Sunlight Hours Yearly

Humidity

Rain

Analytical charts to describe the trend in change of temperatures, sunlight hours, windspeeds, rainfall and humidity

Climate data files obtained from World Weather Online. Retrieved October 10, 2020 from shorturl.at/fghqE
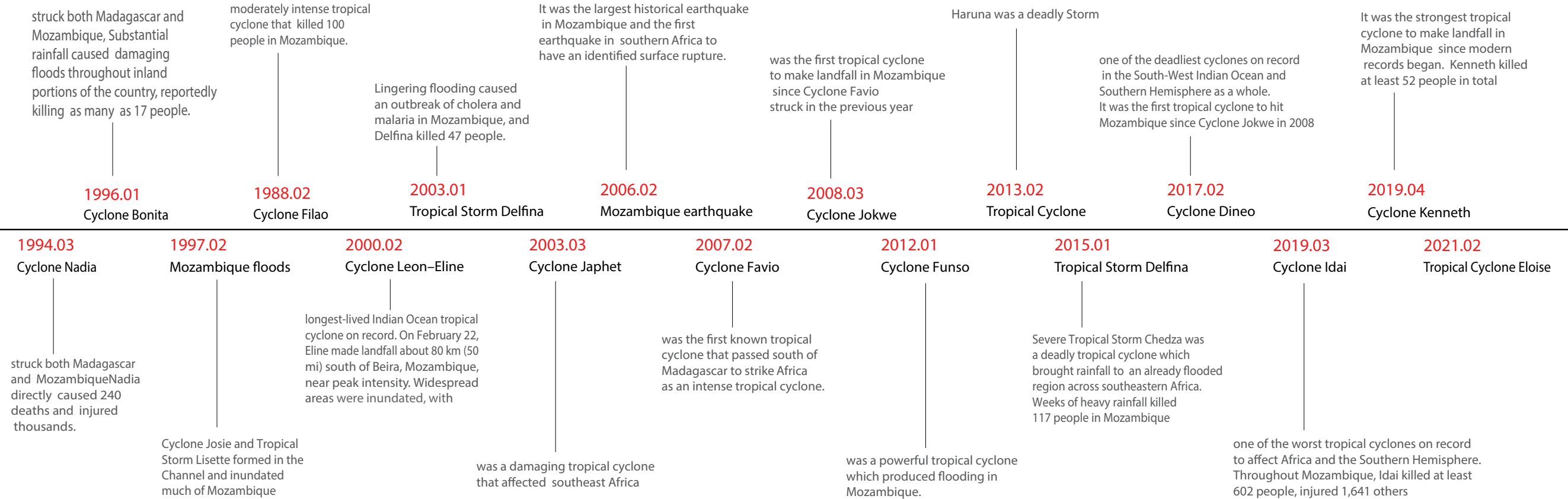
Natural disasters

Mozambique is one of Africa's most frequently and most seriously affected by natural disasters such as floods, cyclones, and droughts. In Mozambican urban areas, approximately 80% of the urban population live in informal settlements, and this makes the city more vulnerable to disasters. (Zhang et al.,2021).

As mentioned, the government has a history of resettling urban residents in post-disaster contexts. However, it has also undertaken such activities to reduce risk exposure (Praia Nova, Munhava) and complete major infrastructure works such as drainage and roads or business development (e.g., IVATO supermarket in Inhamizua). When this occurs, the municipality provides the displaced population with new plots of land (and sometimes a house) in peri-urban

or rural areas (Ndunda, Matadouro, Inhamizua). The success of these resettlement programs is questionable, with many relocated people moving back to their original sites Praia Nova and Hotel Grande are clear examples of this. (Schofield & Deprez, 2019) The interviews are done by the author show this fact in the selected site that will be discussed in the site analysis.

Natural disasters timeline in Beira

Ref:Author

struck both Madagascar and Mozambique, Substantial rainfall caused damaging floods throughout inland portions of the country, reportedly killing as many as 17 people.

moderately intense tropical cyclone that killed 100 people in Mozambique.

It was the largest historical earthquake in Mozambique and the first earthquake in southern Africa to have an identified surface rupture.

Haruna was a deadly Storm

It was the strongest tropical cyclone to make landfall in Mozambique since modern records began. Kenneth killed at least 52 people in total

Lingering flooding caused an outbreak of cholera and malaria in Mozambique, and Delfina killed 47 people.

was the first tropical cyclone to make landfall in Mozambique since Cyclone Favio struck in the previous year

one of the deadliest cyclones on record in the South-West Indian Ocean and Southern Hemisphere as a whole. It was the first tropical cyclone to hit Mozambique since Cyclone Jokwe in 2008

1996.01 Cyclone Bonita

1988.02 Cyclone Filao

2003.01 Tropical Storm Delfina

2006.02 Mozambique earthquake

2008.03 Cyclone Jokwe

2013.02 Tropical Cyclone

2017.02 Cyclone Dineo

2019.04 Cyclone Kenneth

1994.03 Cyclone Nadia

1997.02 Mozambique floods

2000.02 Cyclone Leon–Eline

2003.03 Cyclone Japhet

2007.02 Cyclone Favio

2012.01 Cyclone Funso

2015.01 Tropical Storm Delfina

2019.03 Cyclone Idai

2021.02 Tropical Cyclone Eloise

longest-lived Indian Ocean tropical cyclone on record. On February 22, Eline made landfall about 80 km (50 mi) south of Beira, Mozambique, near peak intensity. Widespread areas were inundated, with

was the first known tropical cyclone that passed south of Madagascar to strike Africa as an intense tropical cyclone.

Severe Tropical Storm Chedza was a deadly tropical cyclone which brought rainfall to an already flooded region across southeastern Africa. Weeks of heavy rainfall killed 117 people in Mozambique

struck both Madagascar and MozambiqueNadia directly caused 240 deaths and injured thousands.

Cyclone Josie and Tropical Storm Lisette formed in the Channel and inundated much of Mozambique

was a damaging tropical cyclone that affected southeast Africa

was a powerful tropical cyclone which produced flooding in Mozambique.

one of the worst tropical cyclones on record to affect Africa and the Southern Hemisphere. Throughout Mozambique, Idai killed at least 602 people, injured 1,641 others

SHELTER

A total of 66% of the residents in resettlements consider food as their main priority, followed by health services (15%), shelter (10%), water (5%), and agricultural inputs (4%). However, the needs remain high in areas where the number of houses damaged is high, such as Beira city. The provision of food alongside the shelter assistance is considered necessary. Under revised HRP, the Shelter sector considered a revised target PIN of 560,000 people (approximately 112,000 households) in the Idai affected provinces and a PIN of 60,000 people (approximately 12,000 households) in the Kenneth affected areas. In total, 620,0000 people (approximately 124,000 households) are still in urgent need of shelter assistance.

Origin Shelter conditions in Areas of origin for families in resettlement sites

The majority of respondents reported that their houses in areas of origin were utterly destroyed by the cyclone hit. Only 3% reported that they are rebuilding, the majority (38%) of whom are from the Sussudenga district of Manica. Half of the rebuilding respondents reported using salvaged materials, while 26% (or nine families) reported using materials they received from aid organizations to rebuild their houses in their area of origin. On the other hand, those reporting unchanged conditions of their houses represent 68% of respondents. Those reporting worse conditions of their houses represent 16% of respondents. (Zhang et al.,2021)

It is evident that more than a year after the cyclone, affected families are still struggling to rebuild their homes fully, both in host communities and resettlement sites, and return to the living conditions they had before Cyclone Idai wrought havoc across Central Mozambique. (Zhang et al.,2021)

Those who were deemed as living in high-risk areas, were displaced and relocated to resettlement sites are still the most vulnerable, particularly in terms of their capacity to begin the process of self-recovery, **with 72%** still living in temporary emergency shelters provided through humanitarian support, more than half of whom report poor living conditions. However, even considering their current living conditions, 3 out of 4 households would not consider returning to their place of origin, mainly due

Refugee camp

A view between tents within the Mahama , Beira refugee camp. Families live extremely close together, and cooking must be done outside

The new humanitarian

to frequent flooding that they have experienced in the past, and also because some have already started building a new life for themselves in their new community and the process of a search for more durable solutions and local integration (Zhang et al.,2021). It is clear that relocation affects the communities negatively, and as UN-HABITAT explains, what criteria make resettlement successful is if it improves the life quality of people who have been relocated. In the case of Beira, statistic shows that this success has not happened, the unwillingness of people going back to their places of origin is because they are trying to start over.

The question here could be: what if they could improve the situation they used to live instead of relocation. The other concern about such resettlement projects is the distance between the camps and the city; as discussed before, the central part of the city is located 10 meters below sea level. Initially, people would be far away from their jobs and a few existing public facilities.

Approximately 1/4 of non-displaced families still living in their place of origin reported that their living conditions had not improved significantly since the cyclone, many of whom claim lack of financial means to access quality building materials. Many reports use salvaged materials from surrounding rural areas to improve their houses. Although this is likely a common construction practice, low-quality materials coupled with a lack of technical knowledge or guidance leave these families vulnerable to future climate-related events. (Zhang et al.,2021)

The overall strategy during the emergency phase is to ensure that urgent and priority needs are met as soon as possible. A well-structured recovery plan is being developed that helps build the resilience of those affected. The first activity to be carried out is the environmental assessment to ensure the safety and development of the shelter areas. The associations rely on protection, shelter management, assistance, participation, and observing the legal framework and minimum standards to ensure this.
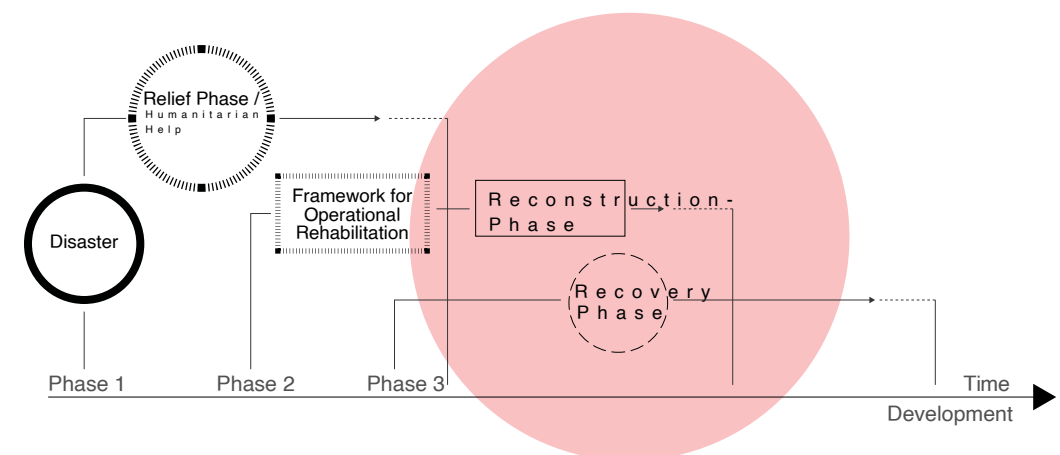
Community shelter guidelines,

Javier Cidón Martínez e Virginia A. Navaza, Mozambican Red Cross www.redcross.org.mz

Recovery strategy Different areas in the Community shelter can be divided into different areas depending on the dedicated use of each area and where it is required to follow the rules and proper use for each area. The shelter can be divided into the following areas: - Services areas:

Implementation phases of the resettlement

vThe intention is to gather all households in a new Quitunda Village located in the limits of the Project extension. This new community includes public facilities such as a school, a community center, and a marketplace and intends to ensure a permanent settlement. (Sinem, 2021)This will result in 1 088 000 inhabitants connected to the sewer network by condominium units. The expansion of the sewer system should be coordinated with drinking water connections and the entire urban water cycle. The proposed idea is based on examples in other African towns by building an oversized main sewer line in each neighborhood and connecting condominium units to it. (Ifrah et al., 2020)

Less than a month after Cyclone Idai swept over Beria, Kenneth hit the northern shores of Mozambique. Kenneth

made its way deep inland, sweeping houses, roads, and electricity grids on its way. Through these Structural Damage Construction Typology images, we can directly discover that Beira suffered a devastating hit by Cyclone Idai.

A strategically important port city, Beira has historically played a crucial role in national and regional economies, linking them to international markets through the broader Beira Corridor. Due to the city's low elevation and proximity to the Indian ocean and nearby Pungwe river, Beira is also known for its extreme vulnerability to flooding and tropical storms, earning the title of Mozambique's most climate-vulnerable city.

However, Beira's most significant relevance is arguably due to its status as an opposition stronghold, which has produced a unique culture of political contestation towards the central state. It is necessary to reflect on the city's historical trajectory, shaping it into today's strategic opposition stronghold to understand the context of contempo-

| COMPARISON of RESETTLEMENT EXAMPLES	TOKI SOCIAL HOUSING COMPLEXES	ELEMENTAL SOCIAL HOUSINGS	MOZAMBIQUE LNG THE LIQUIFIED NATURAL GAS PROJECT	CASA REAL AFFORDABLE HOUSINGS
LOCATION	Turkey All 81 cities of TR	Chile Iquique, Chile	Mozambique Palma, Mozambique	Mozambique Beira, Mozambique
TYPE of ORGANIZATION	Non-Profit Government	Government	Private investors and banks, Mozambican State	Non-Profit Municipality & Government of Netherlands
BUDGET	18,3 billions € (113 billions ₺)	846,403 € (1.000.000 $)	Over $2 o billion	196.839 € (232.479 $)
AMOUNT of HOUSING UNITS	746.618 Housing Units	100 households	553 households	200 Housing Units
TYPE of RESETTLEMENT	Voluntary	Involuntary	Involuntary	Voluntary
ACTORS	-Government Funds -National Treasury -Taxes (collected from abroad citizens) -Private Banks -Private Investors	-Goverment -Private sector -Inhabitants	-Africa Development Bank -Total -Mitsu&co (Japan) -National Oi Company of India -Mozambican State -Nation Petroleum company of Thailand (among others)	-Beira Municipal Council (CMB) -Reall (Private UK based Investor) -Government of Netherlands -Absa Bank (Mortgage Provider) -FOUNT (advisor)
ELIGIBILITY	Randomized lottery amongs low-income families	Inhabitants concerned inside the Project's limit	Inhabitants concerned inside the Project's limit	Middle / Low-income families
POLICIES	-A specific order is followed when funding -Winners selected by random lottery -Winners cannot sell or rent out the houses -obligated to live 15 years on the houses -Far away from city center	-Density capable of paying expensive land cost -Not too dense -Possibility of expansion	-Household compensations -Psychological solace -Assistance before during and after the move -Information about ecological impact not shared to the locals	- A Model for Incremental Housing -Holistic Approach to Building Resilience -End User Financing

rary struggles on urban space in Beira (Shannon, 2019.

All the projects depicted in the table (P.108)have been financed in some way or other by foreign states, either through bilateral modalities, multilateral development banks, or state-owned companies. The financial flows behind these interventions are considerably more complex than Figure 1 reveals, however, as it only depicts the spatial implications of these interventions, not the individual projects associated with each intervention.

In reality, these spatial interventions are generally comprised of multiple distinct projects, spanning various planning and implementation phases. For instance, the Maraza New Town intervention, which consists of the development of flood resilient neighborhoods, compris-

es a slew of projects in the realm of cadastral reform, urban design, engineering, and resettlement (among others). Although some of these interventions may never actually make it to the implementation phase, they are nonetheless part of a complex donor-funded development industry in Beira, centered on restructuring the city's land use(Shannon, 2019).

The Mozambican coastal area is particularly exposed to the impacts of climate change, particularly rises in sea levels and increases in tropical cyclone frequency and intensity. Earthquake risk has been classified as medium, meaning a 10% chance of a potentially damaging earthquake in the next 50 years (Prevention Web). (Schofield & Deprez, 2019)
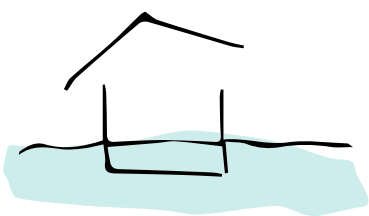
40 %

Live in flood prone areas
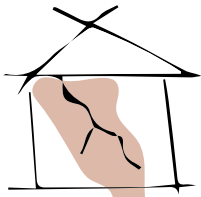
70 %

Live in substandard housing

No Potable water

45 %
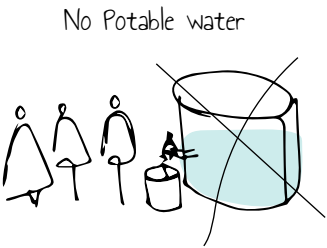
Have no consistant access to quality sources of water

Lving situation in Beira

Ref:author

Urban neighborhoods

The municipal district of Beira comprises **26 administrative 'bairros'** (neighborhoods), grouped in five 'postos', two urban, two peri-urban, and one rural. Each bairro is divided into several 'quarteirões', socially homogeneous subdivisions that are in turn divided in 'unidades' of ten households. Each level is governed by a chief and the chiefs

by the municipal institutional councillor ('vereador'). This organization permits direct, two-way communication and ensures the municipal authorities have good knowledge and understanding of the neighborhoods. (Schofield & Deprez, 2019)

Most of the surveyed neighborhoods have developed since the 1960s in former agricultural areas surrounding the historic urban center of Beira. They benefit from connection and proximity to the city infrastructure and services, even if their internal infrastructure remains very basic. These neighborhoods are inhabited by low- to middle-income families engaged in formal or informal employment in the formal city areas.

Services

Most informal neighborhoods rely on the formal city for services, employment, transportation, health, and education. In the surveyed areas, the interviewees were generally satisfied with the access to services that they had. (Schofield & Deprez, 2019)

Some services, however, remain limited

and unequal. Connections to public networks were more commonly a feature in urban than peri-urban or rural neighborhoods. As an example, the 2007 census shows that, at the municipal level, 28% of the households do not have access to sanitation yet the survey results (carried out in predominantly urban areas) show a rate of 80% access to latrines. In Estoril, sanitation is available on the plot for an average of 72% of households and inside the house for up to 22%. The most unserved area surveyed is Macuti C2, where 20% of households had no latrines. (Schofield & Deprez, 2019)

The surveys show that between 23% and 54% of houses had connections to water networks available on the household plot, and 46% – 70% had access to that of a neighbor. The older communities have better connections to water networks, whereas, in the more recently developed areas such as Macuti C2, all water sources are illegal and come from connection to surrounding neighborhoods.

Summary of The Impacts of Natural Disasters (Period 1956-2008).

Source: Queface, 2009.

N°	Disaster type	# of Events	Total Killed	Total Affected
1	Drought	10	100,200	16,444,000
2	Flood	20	1,921	9,039,251
3	Tropical Cyclone	13	697	2,997,300
4	Epidemic	18	2,446	314,056
5	Windstorm	5	20	5,100
6	Earthquake	1	4	1,440

Surveyed neighbourhoods within areas flooded by the Cyclone

Ref: Schofield & Simon, 2019

INHAMIZUA
21.328

ALTO DA MANGA
24.679

NHANGAU
5.980

MANGA MASCARENAS
33.748

VAZ
10.314

MUAVE
10.966

MUNHAVA CENTRAL
37.785

MARAZA
24.709

PIONEIROS
7.773

MANANGA
28.646

CHOTA
6.100

ESTURRO
29.541

CHAIMITI
17.202

MATACUANE
42.735

PONTA GEA
25.803

MACURUNGO
25.908

MACUTI
17.130

CHIPANHARA
30.953

ref: Final design studio,
PoliTo,2021

SYMBOLOGY

Population: 2.800-10.000
Population: 10.001-20.000
Population: 20.001-30.000
Population: 30.001-42.750

POPULATION BY NEIGHBOURHOOD

0 200 500   1000

People lacking the capacity to work and without family, ties could be among the most vulnerable groups. Markets and women Several of the communities visited had thriving local markets at community entry points from the main road, with residents selling various commodities, including fruit and vegetables, dried fish, and charcoal. Smaller stalls outside of houses are spread through the communities. Markets play an essential source of income generation for women. Women typically own the small stalls found inside of the community, and in the case of Macuti C1, the vast majority of vendors in the primary market were also women. (Schofield & Deprez, 2019) The city's drainage systems from Beira discharge through several outlets, mainly to the Chota drainage system and on the tidal Chiveve-estuary (Ponta Gea/Chamite/ Pioneers). Some of the drains along with the coast, discharge on the beach. (Beira et al., n.d.)

The drains that connect directly to the Chipangara /Palmeiras outlet are called the primary drainage. The connected, open water ditches to this system are called the secondary system. The outlet at Palmeiras is equipped with sluices gates, protecting the canals from high water levels from the seaside. (Beira et al., n.d.)

The overall goal of the Masterplan is to make a significant contribution to a safe, prosperous and beautiful Beira. To realize this overall goal, Beira essentially faces three challenges:

• To utilize the economic potential of the city and its hinterland;

• To improve the currently poor living conditions of a large part of its inhabitants;

• To adapt to climate change and sustainably coexist with its natural environment. (Lda, 2013)

Large parts of the city currently suffer from insufficient basic infrastructure and services, mainly due to the current unplanned and uncoordinated urban development. As the city continues to expand in the current uncontrolled and uncoordinated fashion, the living conditions of the citizens of Beira could be-
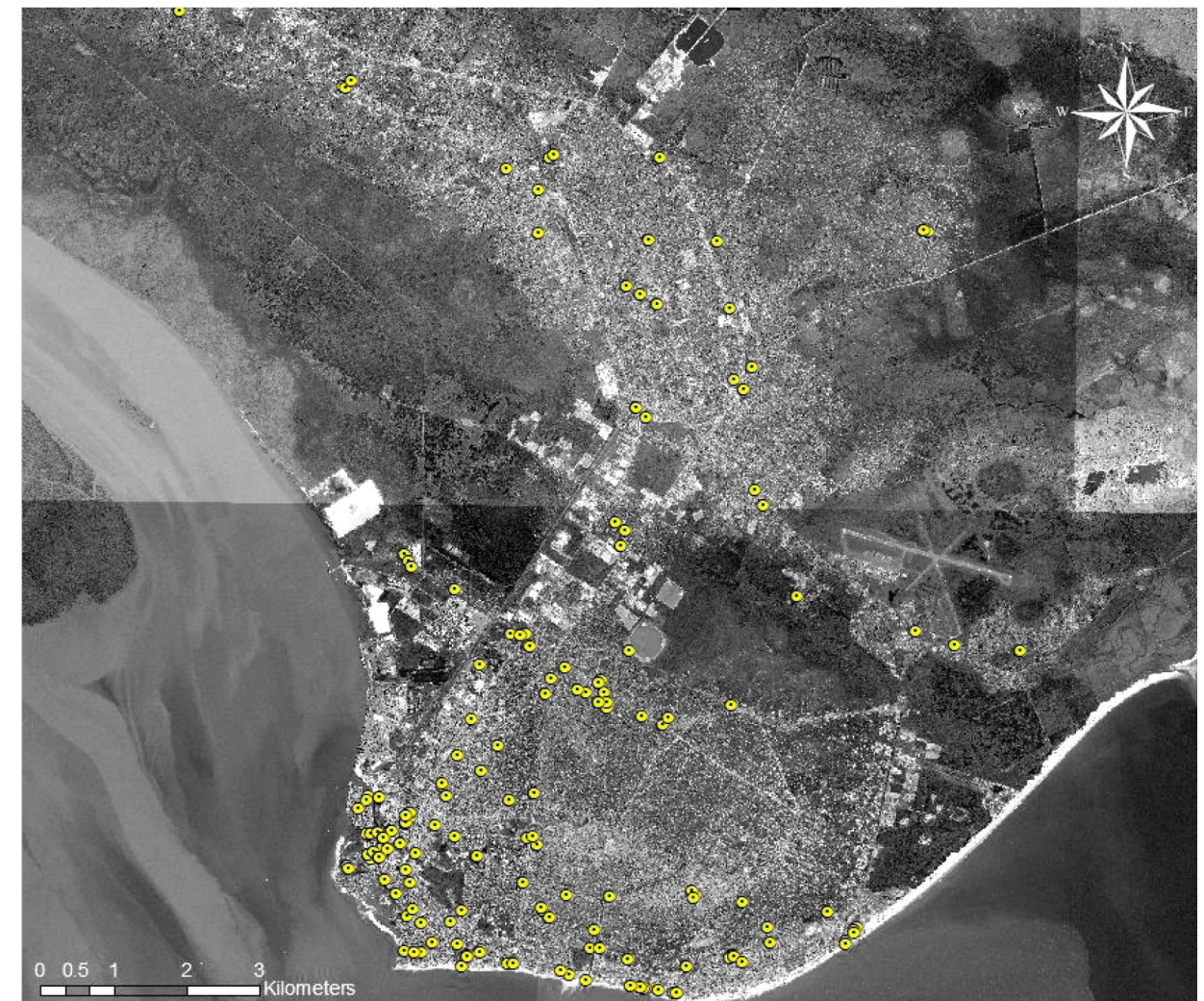
Location of damaged municipal buildings and infrastructure

(Beira et al., n.d.)

Master plans of Beira

come even worse. Moreover, the current unplanned urban development is inefficient and costly in the long term. Planned urban development is necessary to anticipate the rapid growth of the urban population and the rapid urban expansion of Beira. Also, planned urban development is necessary to solve the current problems concerning the poor living conditions of the citizens of Beira. (Lda, 2013)

Flexibility and detail

Urban planning takes place on different geographical scales and within different timeframes. Each geographical scale and timeframe implies different issues and decisions. For example:

• On a neighborhood and street level, housing plots, streets, and sidewalks are delineated.

• The level of uncertainty on this planning scale is marginal. This implies a high level of detail and a low level of flexibility.

• On a city and regional scale, rough locations and sizes of residential areas, industrial areas, and essential infrastructure are indicated for construction in the long term. (Lda, 2013)

The level of uncertainty on this planning scale and within this timeframe is high, to such an extent that some planned developments might not even take place, or the Masterplan is outdated because of unforeseen or unplanned developments. This planning scale and this timeframe imply a high level of flexibility and a low level of detail. The Masterplan is a strategic plan for the whole city of Beira, and the time horizon is 2035. This means the Masterplan will focus on aspects with significant spatial impact and for the long term and should be flexible, i.e., roughly detailed. We assume aspects with minor spatial impact will always fit into the large-scale urban development strategy of the Masterplan. (Lda, 2013)

Aspects with minor spatial impact are, for example, urban waste management, drinking water, sewage, electricity, and

service delivery outside central service areas. (Lda, 2013)

Structure plan Beira - Dondo 1999

Central to the structure plan of 1999 is a strategy of nodal development along the EN6 (the primary access road to Beira). The primary reasons for this strategy were to encourage a broader range of activities, industrial specializations, protection of agricultural land (and ecological zones), and improve transportation access. (Lda, 2013)
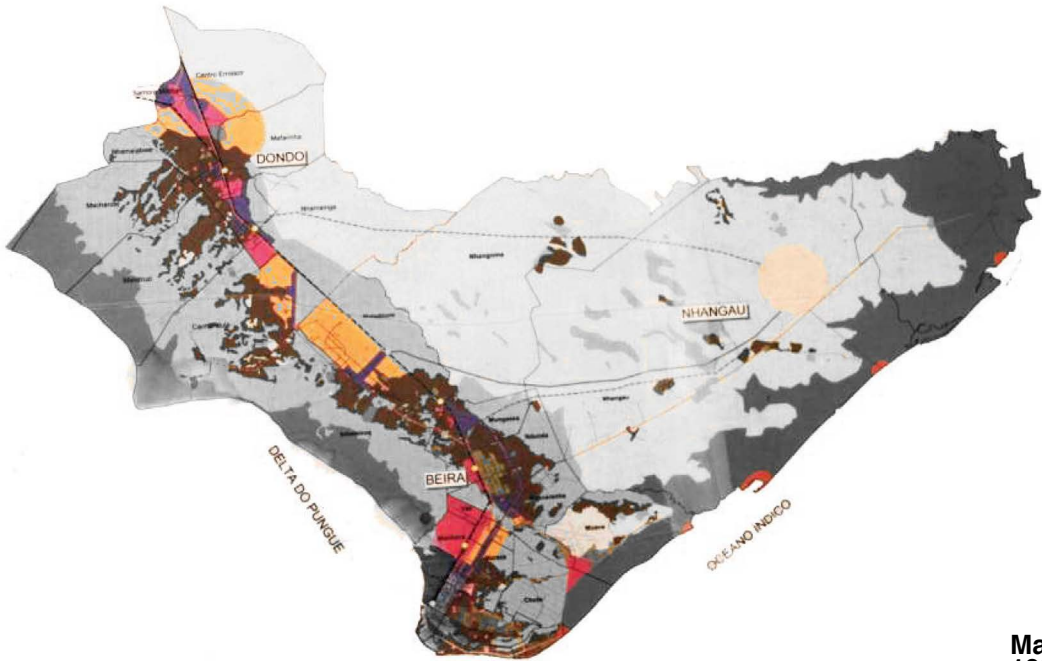
Master Plan 1999

(Beira et al., n.d.)

**"Planta da
Cidade da
Biera", 1936**

Map made by Companhia De
Moçambique, Direoçao De
Agrimensura. Source: www.
purl.pt (Biblioteca National De
Portugal)

**Beira master
plan**
1967 US Army map of Beira

Ref: Lda.2019

Structure plan Dondo 2011

Like the structure plan of 1999, in Dondo's (2011) structure plan, new industrial areas are planned along the EN6 to Beira. Furthermore, new residential areas are planned to the north of Dondo, albeit on a smaller scale than in 1999. Striking differences between both structure plans are the (new) areas for agricultural development and agro-industries west of Dondo. (Lda, 2013)

The urban development strategy of Dondo (2011) is the starting point for the Masterplan concerning urban development of Dondo. Furthermore, we signal the following potential relations between Dondo and Beira about planning and implementation(Lda, 2013)

Port Masterplan 2012

Portos e Caminhos de Ferro de Moçambique (CFM, Mozambique Ports and Railways) intends to develop a port Masterplan which should be finalized in 2013/2014. The outlines of this Masterplan have already been sketched in 2012. The plan in figure 1.6 comprises circa eight kilometers extra quay length and new transport infrastructure. The expansion strategy in the upstream direction of the Pungue River is the starting point for the Masterplan Beira 2035(Lda, 2013).

Master plan zoning map

• The current city center should be revitalized via functional upgrading and expansion of the current city center and restoring buildings and public spaces.

(Lda, 2013).

Master Plan 2011

(Beira et al., n.d.)
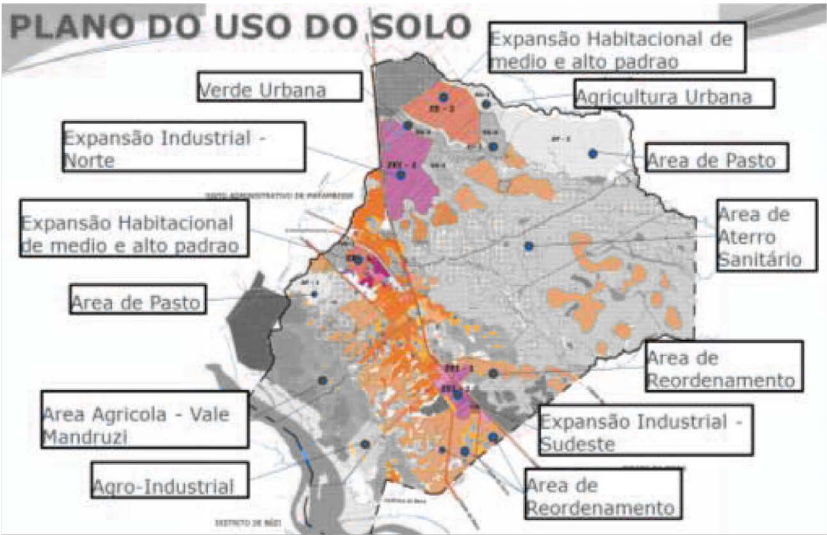
Atlas of Informality
260 informal settlements in 147 cities, 102 countries are mapped.

website: Atlas of informality
https://www.atlasofinformality.com/

Master Plan 2011

(Beira et al., n.d.)

BEIRA,2035

Master plan proposal by
Witteveen+Bos

Ref: https://www.
witteveenbos.com/projects/
masterplan-beira-2035/

Maraza

Conclusion

As reviewed in this chapter, the factors that should be considered for the future scenarios for a city like Beira are directly related to informal settlements. They can be listed as below:

- **Population growth**
- **Unemployment**
- **Adaptation to climate change**
- **Housing qualities**
- **Hygiene and sanitation**

Since informal settlements are 80% of the Beira population, addressing the issues above could improve the city's situation noticeably. Addressing each of mentioned above is essential and requires more effort. However, one may have this general scheme to understand how these whole work together.

Another critical aspect of any intervention is understanding to what extent this decision-making and approaches are adaptable to African/ Mozambican cultures. The drawing tries to connect these different factors and to show their relationship with each other.

In the next chapter, the non-western approach to city making in Africa and the role of informal settlements.

Informal settlements
Slums

approaches

why
where
how

ignoring
relocating
upgrading

far from public facilities

no long-term integration

people returning to slums after a while

Beira

to look at it as an event
locations with potentials

job
sanitation
community
flooding
importance of streets
master plan

Afrofuturism

to be continued in chapter 04
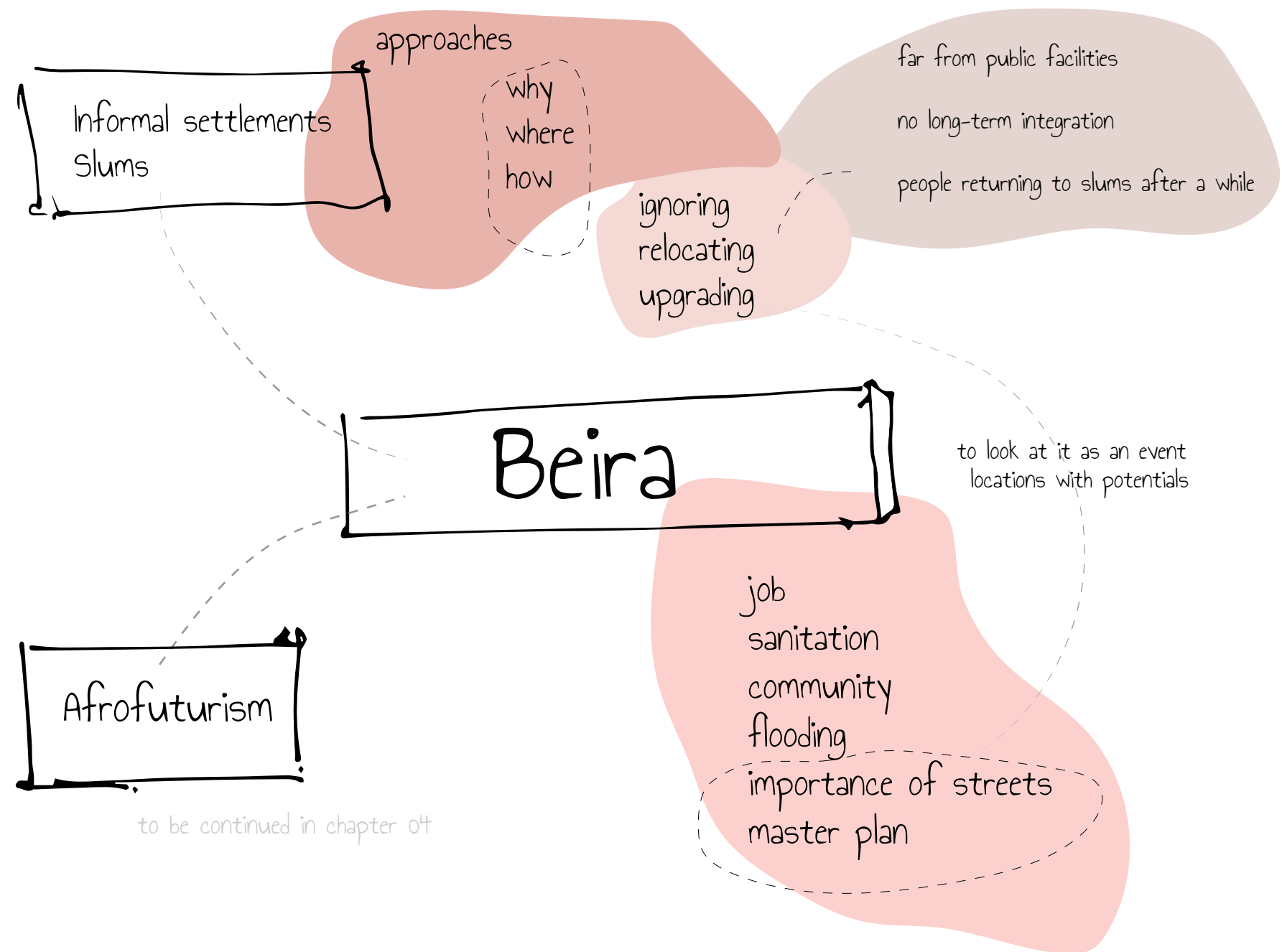
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    map to Building Beira Back Bette r. 2.

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    Flood Protection in Mozambique's Cities. January.

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    (2021). Back to Beira, Infrastructure.

Insinna, L., Shroff, D. N., Acer, S., Bulzoni, F., Zhang, Y., Carlucci, C. B., & Yildirim, U. S. (2021).
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Schofield, H., & Deprez, S. (2019). Supporting urban recovery after Cyclone Idai. Care, May.

Sepehr, A., Tejas, J. A., Shakeel, A., Jinxuan, T., Berkay, O., Busra, K. U. S., & Tugana, A. (2021).
    Back to Beira, Climate.

Shannon, M. (2019). Who Controls the City in the Global Urban Era? Mapping the Dimensions of Ur-
    ban Geopolitics in Beira City, Mozambique. Land, 8(2), 37. https://doi.org/10.3390/land8020037

Shannon, M., Otsuki, K., Zoomers, A., & Kaag, M. (2021). On whose land is the city to be built?
    Farmers, donors and the urban land question in Beira city, Mozambique. Urban Studies, 58(4),
    733–749. https://doi.org/10.1177/0042098020929237

Sinem, Yuan, Charbel, Santiago, Aysenur, Alba, H. (2021). Back to Beira, Resettlement. In Final
    design studio, Politecnico di Torino.

Tas, A., & Belon, A. (2014). A Comprehensive Review of the Municipal Solid Waste Sector in Mo-
    zambique Background Documentation for the Formulation of Nationally Appropriate Mitigation
    Actions in the Waste Sector in Mozambique. CarbonAfrica, June, 9.

Wang, Celi, Elzanfaly, Feng, Sagirolu, Sorkhei, T. (2021). Back to Beira, Society.

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Chapter 04

Afrofuturism

This chapter presents the Afrofuturism definition and how it is related to informal settlements. Elements like women and water alienation that correlate with Beira's current situation are present highly in Afrofuturism. In conclusion, the author suggests considering these elements for any future design in the city.

Two case studies are discussed to emphasize the presence of informal settlements in future african cities.

Afrofuturism

There is a close correlation between African architecture and Afrofuturism, as is discussed in this chap-ter.

Afrofuturism is a cultural aesthetic, philosophy of science, and philosophy of history that explores the developing intersection of African diaspora culture with technology.

The term is developed firstly by Mark Dery in 1993 and developed more in the late 1990s. Afrofuturism can be discussed through African diaspora, technoculture, and science fiction themes.

As Wocmack defines this term in Afrofuturism, "**it is an intersection of imagination, technology, the future culture, and liberation.**"

Dr. Kathy Brown, a professor at UNT College of Visual Arts and Design, paraphrases I.Bennett Capers (2019) work, stating that Afrofuturism is about "forward-thinking as well as backward thinking, while having a distressing past, a distressing present, but still looking forward to thriving in the fu-ture." (Afrofuturism - Wikipedia, n.d.)

The main themes in Afrofuturism research demonstrate the strong linkage between this term and art that includes Feminism, Grotesque, Alienation, Water, and reclamation.

Each of these is discussed briefly in this chapter.

Afrofuturism within music represents a diaspora of music that is non-traditional, focusing around the topic of blackness and space
Poster promoting a concert performance of American jazz musician Sun Ra and his band, the Omniverse Arkestra, on October 11, 1980, at the Old Waldorf in San Francisco.

(New York Public Radio)

Fashion and afrofuturism

Fashion as a Means of Reclaiming Tradition and Envisioning a Brighter Future
Photographer: William Ukoh, Stylist: Daniel Obasi

Photobookmagazine

Feminism

Jared Richardson's Attack of the Boogeywoman: Visualizing Black Women's Grotesquerie in Afrofuturism assesses how the aesthetic functions as space for black women to engage with the intersection of topics such as race gender, and sexuality. The representation and treatment of black female bodies are deconstructed by Afrofuturist contemporaries and amplified to alien and gruesome dimensions by artists such as Wangechi Mutu and Shoshanna Weinberger . (Architecture of Wakanda — Matechi, n.d.)

Beyoncé's 2016 short film Lemonade included feminist Afrofuturism in its concept (p.39.40)

The novel Kindred by Octavia Butler also explores women's empowerment through the story of her protagonist Dana.

The book explores the idea of autonomy and having control over one's life/destiny. Through the exploration of women's power in the time of slavery to the more current time, Butler is able to demonstrate the endurance of women through the harsh social factors.

Ancient to the Future: Afrofuturism, Cyborgs, and the Posthuman

Ref: https://asuevents.asu.edu/content/afrofuturism-and-cyborg-feminism-discussion-steven-shavirov

Grotesque

IIn the Afro-Surreal Manifesto, Afro-Surrealism is juxtaposed with European surrealism, with European surrealism being empirical.

It is consistent with Trey Ellis' essay, "The New Black Aesthetic" in that the art seeks to disturb. Afro-Futuristic art samples from old art pieces updating them with current images. This technique calls to the forefront those past images and the sentiments, memories, or ideas around them and combines them with new images so that those of the current generation can still identify. Afro-Futuristic artists seek to propose a deviant beauty, a beauty in which dis-

embodiment is both inhumane yet distinct; Afro-Futuristic artists speculate on the future, where Afro-Surrealism is about the present.

The novel Kindred by Octavia Butler also explores women's empowerment through the story of her protagonist Dana.

The book explores the idea of autonomy and having control over one's life/destiny. Through the exploration of women's power in the time of slavery to the more current time, Butler is able to demonstrate the endurance of women through the harsh social factors.

Alaniation

Afrofuturism takes representations of the lived realities of black people in the past and present and re-examines the narratives to attempt to build new truths outside of the dominant cultural narrative.

By analyzing how alienation has occurred, Afrofuturism works to connect the African diaspora with its histories and knowledge of racialized bodies. Space and aliens function as crucial products of the science fiction elements; black people are envisioned to have been the first aliens through the Middle Passage .

Their alien status connotes being in a foreign land with no history, but as also being disconnected from the past via the traditions of slavery where slaves were made to renounce their ties to Africa in service of their slave master.
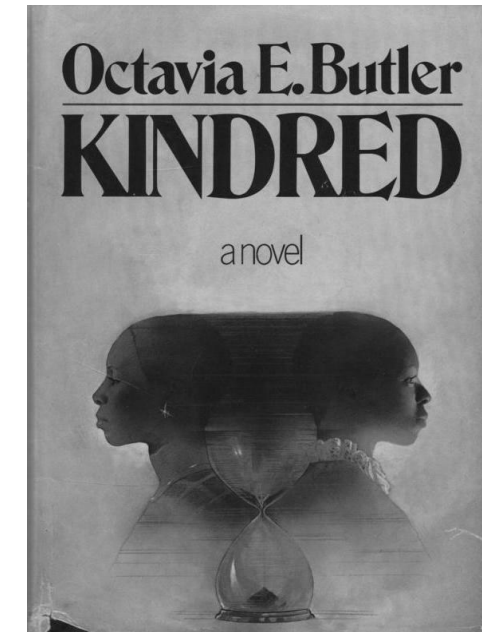
First edition cover of
Kindred

Water   Reclamation

In many different Afrofuturist works, water and Black women are symbolically linked in their connection to both the erasure and emergence of black life.

These meanings, while seemingly contradictory, actually playoff and inform each other (Bristow, 2014) . Examples of Afrofuturist work dealing with the theme of water include the 2009 Kenyan film *Pumzi*, various songs in Beyonce's Lemonade, the work of Detroit Techno group Drexciya, and Kara Walker's 2019 sculpture Fons Americanus.

Afrofuturism has to do with reclaiming those identities or perspectives that have been lost. When Mark Dery coined the term, he saw Afrofuturism as giving rise to "a troubling antinomy: Can a community whose past has been deliberately rubbed out, and whose energies have subsequently been consumed by the search for legible traces of its history, imagine possible futures?"

Furthermore, Afrofuturism is not restricted to any single medium; there are Afrofuturist novels and musical works. However, whatever the medium, Afrofuturism involves reclaiming some agency over one's story, a story that has been told, throughout much of history, by official culture in the name of white power.

It is for this reason that Dery says, "African-American culture is Afrofuturist at its heart." Because the ancestors of many African-Americans were forcibly removed from their homelands and stripped of their history like most slaves, any culture that has found its way into the Black lexicon is at its roots an Afrofuturist notion. It is at its heart reclaiming a past erased and creating a future based on that reimagined past.

Pubmzi

The afrofuturistic vison
Drought, water, women

Ref: https://vimeo.
com/46891859

Sun Ra

He developed a mythical
persona and an idiosyncratic
credo that made him a
pioneer of Afrofuturism.

Ref: https://www.sfjazz.org/
onthecorner/we-travel-space-
ways-afrofuturism-music

Forward

Beyoncé. Lemonade.

Ref: https://cosgrrrl.com/the-past-and-the-future-merge-to-meet-us-here-afrofuturism-in-lemonade-41d86b3dccce

Wakanda, another future for African cities

Wakanda is the fictional setting for Black Panther, a Marvel movie released in February of 2018. The prologue of The Black Panther narrates this fictional world as follows: "Unfettered by the yoke of colonization, the African warrior nation of Wakanda flourished, and became a sophisticated, resourceful, ecological and paradise—one that makes the rest of the world seem primitive in comparison". The movie is full of architectural visualizations, utopian city projections, and African cultural motifs which reimagine a new country. Quickly, this architectural Afrofuturist work can be placed more towards the global pole of the local-global spectrum. Writer Jamil Smith explains, "Black Panther is the 18th movie in the Marvel Cinematic Universe which has made $13.5 billion at the global box office over the past 10 years".

This statement alone makes Black Panther extremely significant as a part of the Marvel movies, a collection of worldwide cinematic influences that grace the screens of thousands of movie theaters and televisions worldwide (Roos et al., 2020). Smith continues commenting on the effect of the movie on the audience: Black Panther is emblematic of the most effective responses to bigotry: rather than going for racists opinion, it celebrates what those who choose to prohibit equal representation and rights are ignoring, willfully or not. They are missing out on the real possibility of the world and the very America they seek to make 'great.' They cannot stop this representation of it.

The fictional nation of Wakanda in **Black Panther**
architecturaldigest

The fictional nation of Wakanda in **Black Panther**
architecturaldigest

This movie teaches those who are a part of the Afrofuturist movement how to cope with adversity. The visual projection of architecture in the movie is a significant supporting element to the overall message that the movie is advertising: a message of equality and justice. Moreover, it touches the lives of Africans and those in Black communities worldwide and motivates them to fight for social justice and their future. This movie is for all: people who support the movement and whose perspectives of the future can be changed through the means of Afrofuturist exposure.

not necessarily linked to a specific local influence, the Afrofuturism in the movie itself is. Other aspects of the movie, like fashion mentioned above, showcase elements of local African cultures. This changes how Africans, and how the people of the world see more localized cultural iconography. Generally, the architectural influence of Wakanda speaks to a global audience. However, when analyzing the local elements used in the movie and identifying smaller communities that have been impacted positively by the movie, it can be inch toward the local environment.

Indigenous African
Architecture
samuelaston

There are localized benefits to this movie's architectural projections and overall message. As a localized example, Black Panther showcases fashion motifs from Zulu culture in South Africa. Chutel and Kazeem write about this Zulu motif, commenting on the inspired outfits designed by Carter, "For Black Panther which had dramatic white Isiolo 3D-printed", and showcasing how local technology and local cultural motifs made up elements of this movie.

While the architecture of Wakanda is

Although the film provides social commentary on very human-centered, socially realistic topics, the architecture of Wakanda is far from being realistic itself. It is wholly imagined with cultural allusions, skyscrapers, and magnificent "virtual reality" aesthetic accomplishments.

Indigenous African
Architecture
https://e-playafrica.
com/ghana-to-build-
wakanda-city-to-
boost-tourism-sector/

Reporter Patrick Sisson comments on the realistic nature of this movie when he writes, "When reality is so bound up in issues of place and separation— redlining, urban segregation, and the jarring impact of the slave trade, a forced trip to an entirely alien world—it follows that fictional commentary would mine these rich veins of common experience". The fictional environment of Wakanda allows the audience to be completely separated from reality, presented in a new vision of the future that might not have ever imagined before, in a new, hopefully, Afrofuturist and pro-Black way.

Strong and Chaplin write, "The film's ability to imagine a futuristic and alternative uncolonized Africa provides audiences with positive portrayals of Africa beyond stereotypes of civil warfare and violence, disease, famine, and other social ills". This vision allows viewers to imagine a world absent of the ills Africans and those of African descent have had to endure until today.

The removal of reality creates a new, imagined reality based on community power, Black power, and cultural integrity. It also gives viewers a new perspective on what the future could hold and what it could have held if history were to rewrite itself.

After the above synthesis, Wakanda is placed towards the speculative pole on the realistic speculative axes. Wakanda as the setting of Black Panther completely reimagines a Black-centered future by creating an architectural portrayal of what "could have" or "should have" been despite historical realities that still plague the world today.

This movie promotes the essential ideals of Afrofuturism, and Africans can create and contribute to the world's future. Through its architectural portrayal, Wakanda became an empowering speculative vision to African communities alike (Capers, 2019). Strong and Chaplin agree on this stance of Wakanda's impact writing, "Science fiction and media usually have systematically ignored and limited Blackness, however, Black Panther was an undeniable expansion of Blackness". By removing reality and portraying Wakanda, it begs the audience to reflect on reality. Wakanda and its architectural grandeur empower Africans and Black communities by giving them a new worldwide perspective on what could be. It equally allows all who do not feel the effects of discriminatory futurology to reflect on reality while reimagining an Afrofuturist future.
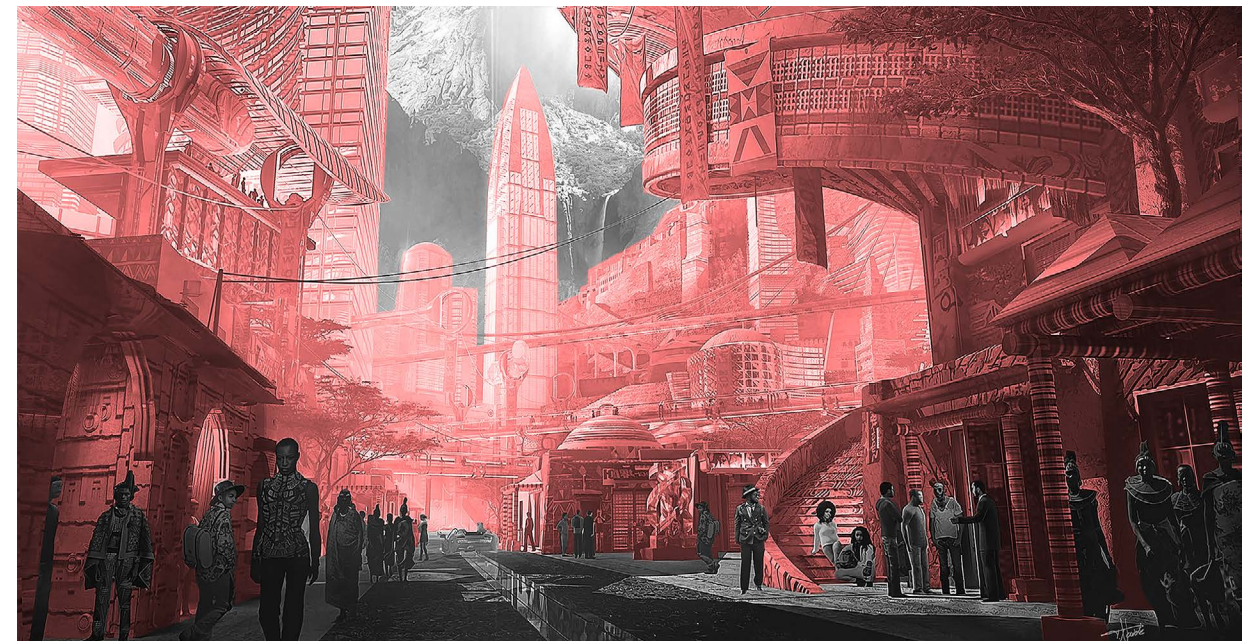
Concept Sketch for The Golden City
Artist: Till Nowak
Wepresent

Concept Art of **Black Panther**
Artist: Till Nowak
Artstation

Shanty Mega-Structures by Olalekan Jeyifous

Olalekan Jeyifous, the artist of Shanty Mega-Structures, uses Afrofuturist architectural representation as a commentary on the future of African urban centers and townships. His purpose of these rendered, imaginative housing structures is to "juxtapose sites of privileged and much-coveted real-estate throughout Lagos with colossal vertical settlements representing marginalized and impoverished communities." The Afrofuturist aspect of this work criticizes the present by using Afrofuturism to suggest what today could birth for Africa's urban future and what the possibilities of the future could be (Capers, 2019). A mix of technological and architectural innovation confined within the township setting makes this project a unique Afrofuturist work, a traveling series that has the power to impact both the world and local audiences.

As an art series with a strong presence in the world, there is a strong pull for this artwork to be considered a global work. The interviewer Kai Cheang writes, "as a worldwide, metropolitan appeal of this work is its image of a future where technology, urbanism, and capitalism are taken to their technologized, highly segregated extremes." Jeyifous's work is exposed to different countries and different cultures and has an indigenous place, and as the setting of his work, it is particular to his architectural analysis. Joyous writes about Lagos, saying, "It is one of the fastest-growing megacities, and an enormously fascinating for architects, urban planners and anyone else intrigued by its potential". This unique potential has influenced the idea of urban Africa around the world.

MOZAMBIQUE - Beira Province - Flood extent - Reference map with health facilities and flood extent
Mapcentre

Jeyifous, Olalekan. Shanty Mega-Structures. (2015). Olalekan
Final Thesis, Emily Roos,2020
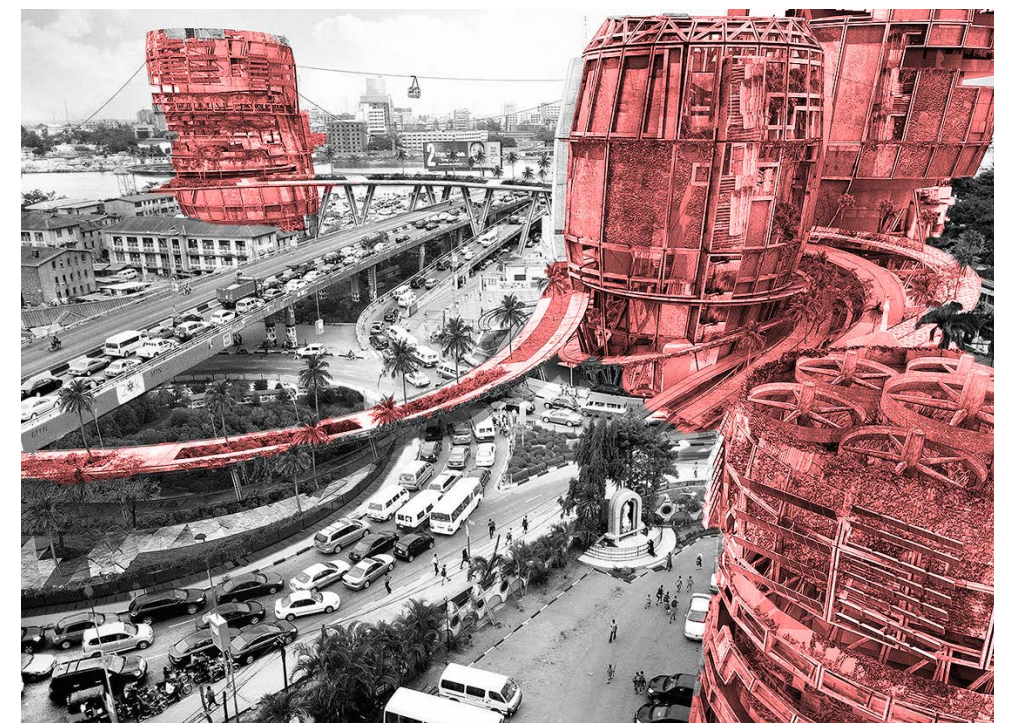
Jeyifous, Olalekan. Shanty
Mega-Structures. (2015).
Olalekan
Final Thesis, Emily
Roos 2020

Conclusion

As discussed in the previous chapters, informal settlements are an integral part of the future, as statistics show. The challenges in Beira are directly related to informal settlements. By studying the history of the city is has been realized that the approaches to informal settlements are mostly with relocating them and with no correlation with the current context they used to live in. in this chapter, the connection with Afrofuturism as future visions for informal settlements and elements that are present in informal settlements have been reviewed.

It is clear that an apparent connection is present among these factors; therefore, the author suggests defining new scenarios for the city regarding this perspective. She tries to implement these policies in the next chapter on a selected site.

Informal settlements
Slums

approaches

why
where
how

ignoring
relocating
upgrading

far from public facilities

no long-term integration

people returning to slums after a while

Beira

to look at it as an event
locations with potentials

Afrofuturism

job
sanitation
community
flooding
importance of streets
master plan

nonwestern approach
locality
informal settlements in the future schemes

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Reddell, T. (2013). Ethnoforgery and Outsider Afrofuturism. Dancecult, 5(2), 88–112. https://doi.org/10.12801/1947-5403.2013.05.02.05

Roos, E., Roudbari, S., Osborne, M., & Chinowsky, P. S. (2020). "Afrofuturist" Architecture The Promises and Pitfalls of Future Architectural Imaginations. In Colorado.Edu. https://www.colorado.edu/envd/sites/default/files/attached-files/roos_final_thesis_2020.pdf

Yaszek, L. (2005). An Afrofuturist reading of Ralph Ellison's Invisible Man. In Rethinking History (Vol. 9, Issues 2–3, pp. 297–313). https://doi.org/10.1080/13642520500149202

Yaszek, L. (2006). Afrofuturism, science fiction, and the history of the future. Socialism and Democracy, 20(3), 41–60. https://doi.org/10.1080/08854300600950236

Chapter 05

Analysis and Proposal

In the previous three chapters, multiple factors present in Beira have been studied to address informal settlements. This chapter analyzes different locations in the city for any future interventions and urban/neighborhood strategies.

Selected site in Munhava neighborhood
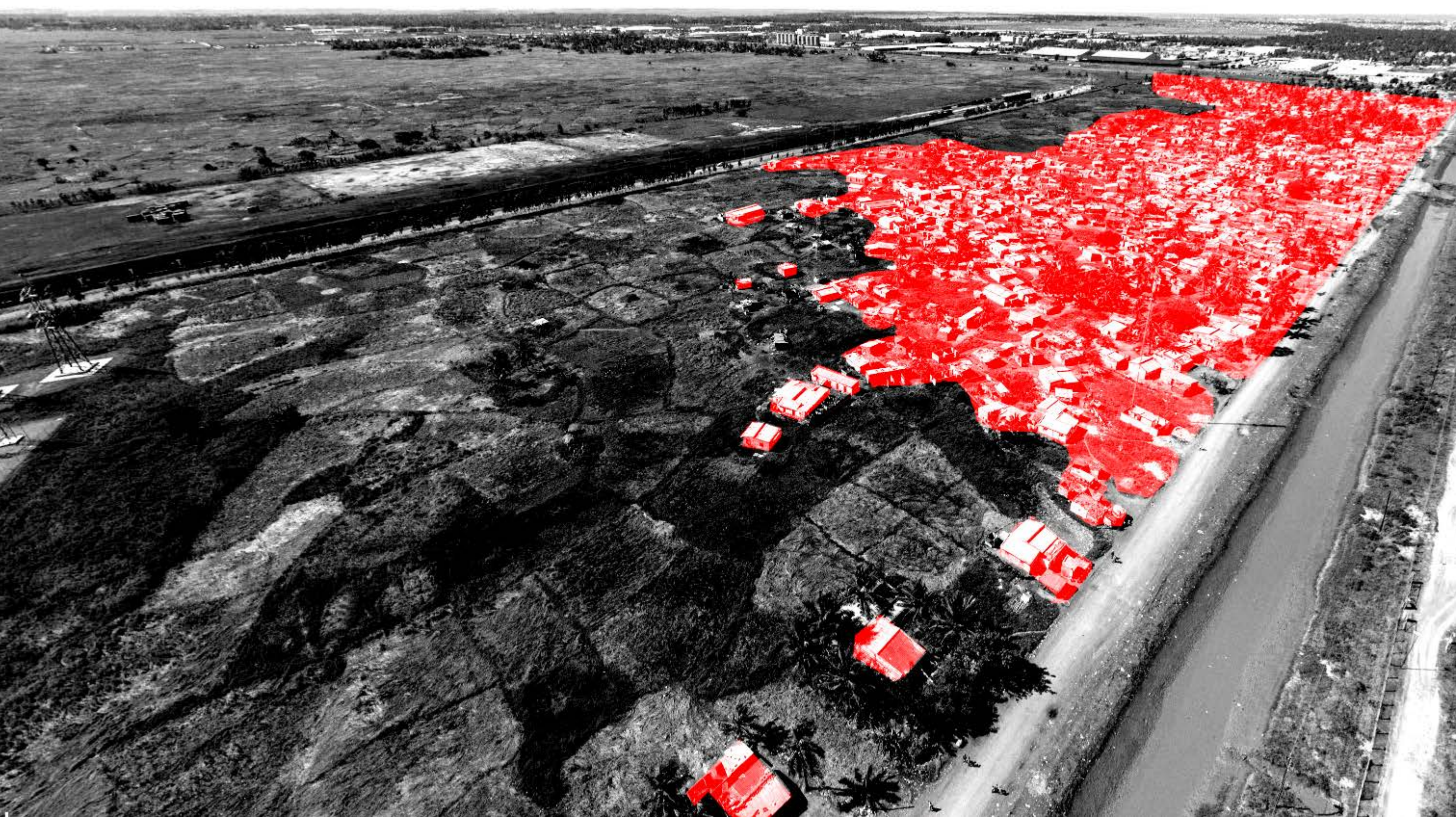
Beira now

Ref: MUNICIPAL RECOVERY, 2019
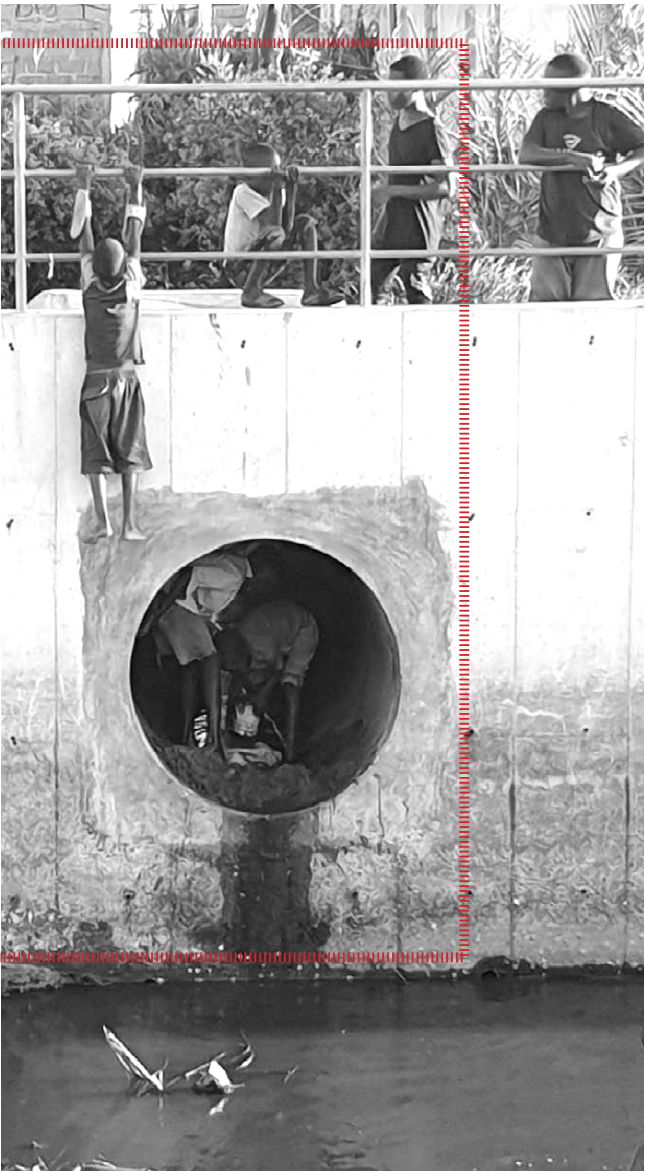
Poor infrastructure and lack of public facilities
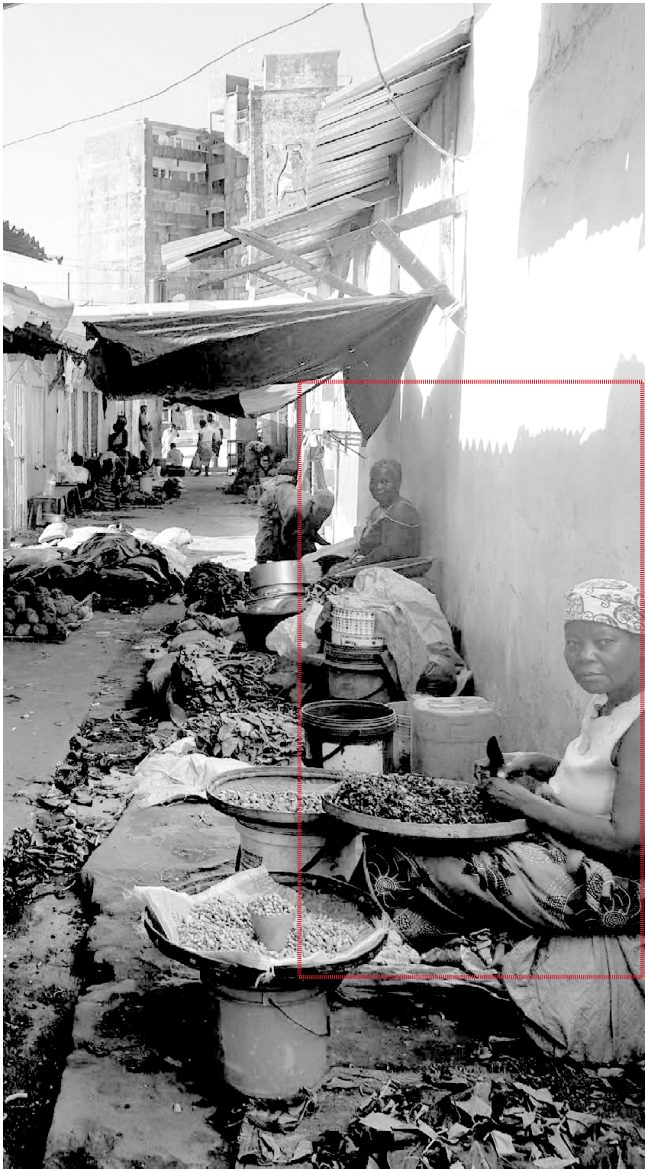
The importance of streets and the role of women in the city

Housing crisis

Quality of streets

There will never be enough money or time to do all the necessary items if we try to do them separately. More localized design strategies can simultaneously manage stormwater, improve housing quality, mitigate pollution, ensure water and food security, and provide opportunities for more robust local livelihoods. Social capital enables communities to create their adaptation strategies. Displacing communities threatens valuable social networks, squandering social resilience.

Beira Future

In spite of its many problems, Beira also has attractive potentials. Informal settlements and(or) slums can be upgraded and incorporated rather than cleared in a new bold futuristic yet originally African vision of a positive future.
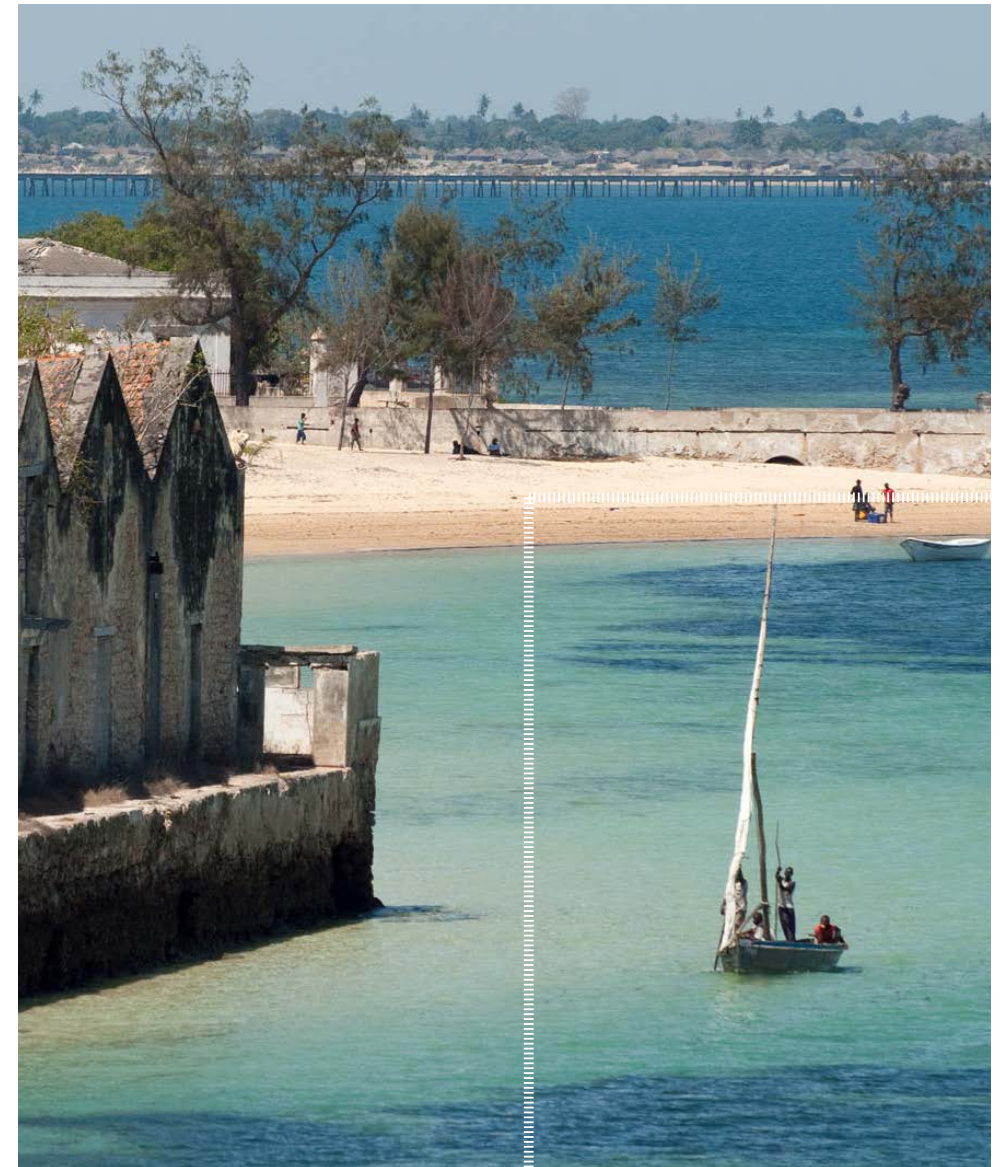
Informal settlements with potentials

The four the chosen sites demonstrate informal settlements in different zones of the city; one is chosen because of its potential for upgrading.

One of the main reasons for this selection was the previous relocation failure of people from informal settlements to the camp area, which the government presented for a better quality of life for the citizens.

This specific place was chosen for the design prototype based on the study that the author had according to the failed relocation of people from this site to another place because this specific site is in the industrial zone of the future master plan.

Even though the municipality offered a better housing quality, people rent these houses and return to the urban fabrics they used to live in.

This result requires profound research to understand the percentages of the people who were back or the main reason. These observation has been taken place by via Beira community Facebook page and online research.

Munhava

Second populated zone in Beira
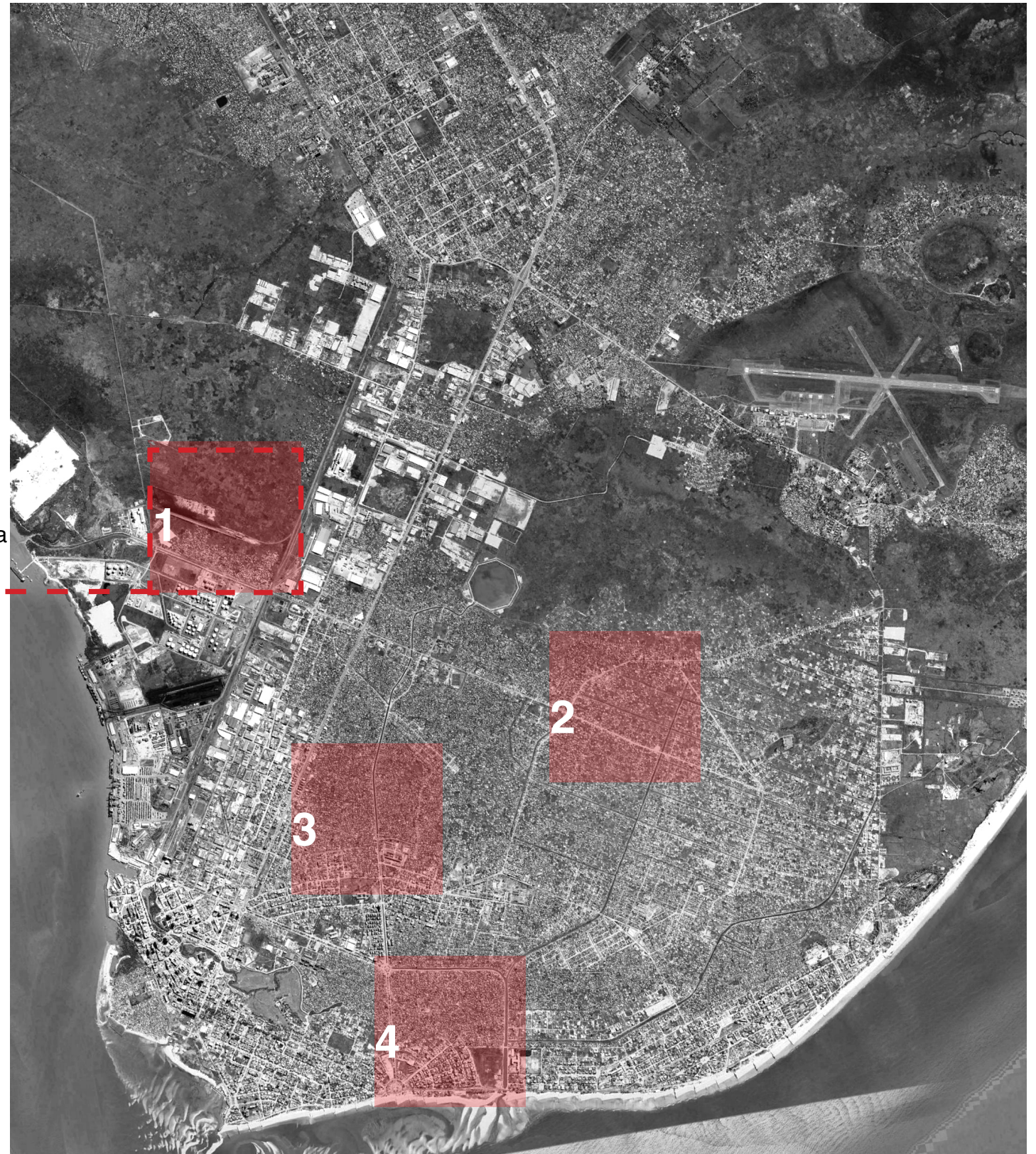
After careful analysis that has been done based on previous chapters, the author aims to search for informal settlements sites that have the potentials to be improved based on:

Mobility
City Expansion
Current Occupation
Employment

The items mentioned above have a massive impact on the potentials of the site for future livability. The author does not consider the flooding sites since this factor is present all over the city and makes this analysis invalid.

However, the implementation has been taken place based on the maximum height of the earth in the area.

Analysis Methodology:

the study took place remotely and based on Google Earth views, the city map, GIS, an interview with a person from the municipality, and the Facebook group of Beira community for the site analysis, UN-HABITAT, and Red Cross reports were the main ingredients of this chapter.

Future City Expansion
Job - Housing- Food

Harbor

Munhava garbage dump

Existing industrial zone

Future industrial zone
(master plan 2013)

Manga

Future coal
terminal

IGBT and Oil Tankers Parking
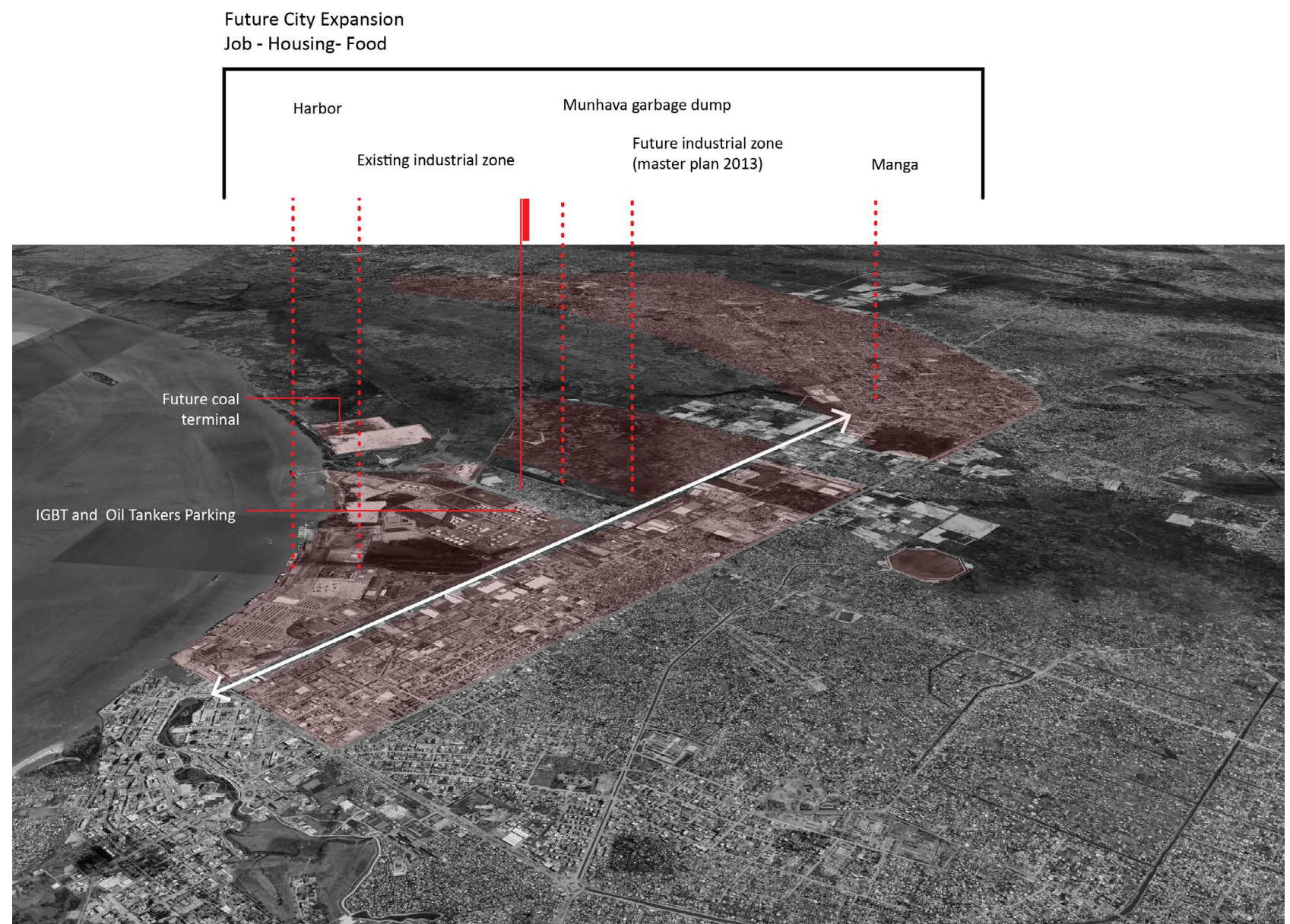
Main principles

As the diagram shows, the main princi-
ples are selected based on the potential
of the site:
four principles are introduced to ad-
dress the issues of informal settlements
in Beira. The challenges are directly re-
lated to the final master plan of the city
and international aids regarding tropical
flooding in Beira. It should be noted that
each mentioned item brings an essen-
tial effect on the vibrancy and the neigh-
borhood's livability, and if the same
approach is applied anywhere else in
Beira, it could dramatically change the
quality of life in the city. It should be
noted that such massive interventions
require strong collaborations among pri-
vate and public sectors.
This proposal mainly focuses on the
urban strategies rather than on policy-
making at the investors' level.

The strategies have been applied in the
selected site as a prototype with a dif-
ferent approach to informal settlements
than the last version of the Beira Master
Plan.

streets

Cyclone shelter

Strategies

River and drainage

Agriculture
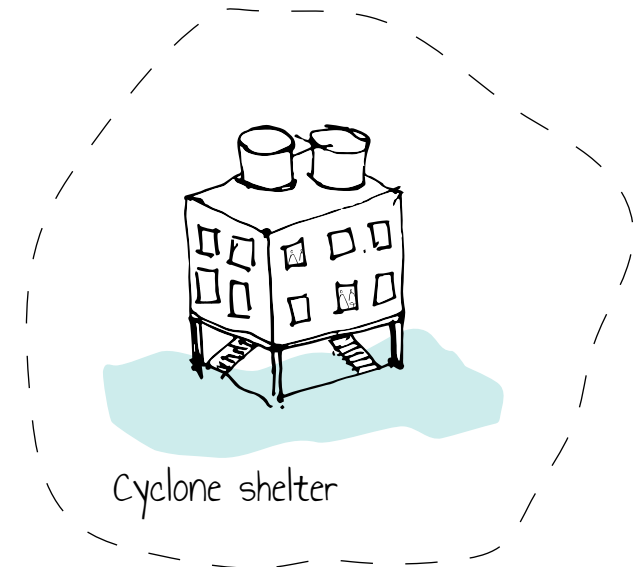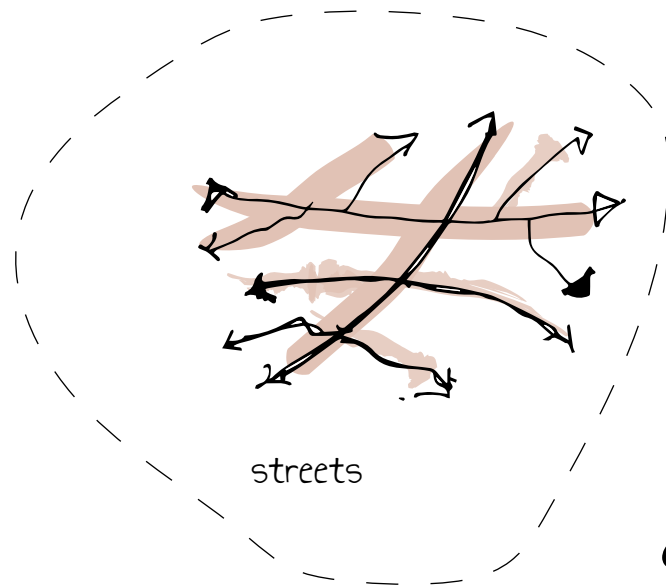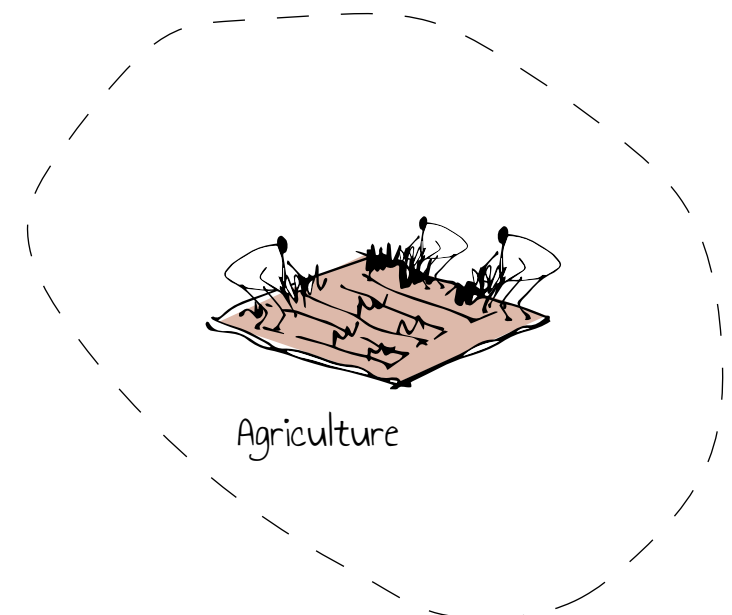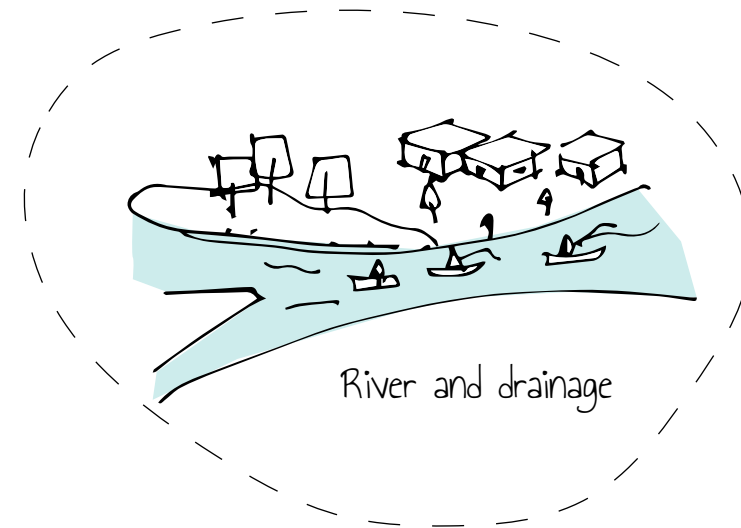
Streets:

The role of streets is quite present in shaping Beira. One of the main facilities that affect shaping the high or luxury part of the city were streets, while slums neighborhoods do not have such high-quality streets. Streets not only improve mobility in the neighborhood, but they are a platform for socializing. Multiple studies have been done on emphasizing the importance of public spaces and communities in shaping neighborhoods that are highly present in streets in the case of Beira. Street markets, children with no playfield but streets, and other outdoor domestic activities were studied in detail in chapter 03(Biera).

Street and agriculture two of the main principles

10% of the units being demolished for street access

in the master plan proposal, families of demolished houses, will be offered new units in the same site.

Self built roads

Agriculture in the site

How:

• The analysis tries to define microneighborhood and demolish as less as possible of the existing units and offers to demolished

• Demolition houses **10 % of existing units: 950 units have been identified in the selected site(p.169)** . As the diagram shows, the area for each family(considering four member families as the average) **varies between 40 sqm to 80 sqm. The suggested modules allow families to expand the housing in the defined area in the neighborhood expansion zone.**

• After this relocation that is just close to the existing site, the next step for such intervention is going to be the zonification within the existing units.

• That is based on the closeness of the existing units to each other. Assuming that this neighborhood is somehow self-organized, the author suggests that the first intervention step is no physical zonification.

• The empty areas are defined for neighborhood internal access considering a minimum of 2 meters and a maximum of 5 meters.

• This organization allows the creation of a form for neighborhood metabolism growth.

The result of this principle is:

• Easy access within the neighborhood
• Livability and Outdoor Domestic Activities like markets and socializing

1. the demolition of 10% of exisiting houses(short term)

2. public facilities in the existing urban fabric(short term)

3. elevated buildings for the future density growth(long term)

4. enhance the accessibility by vertical streets(long term)

Studied units interiors

proposals for the new constrcution in the site

Interiors study

The filled red blocks represent studied units that by google earth view photos have been done.
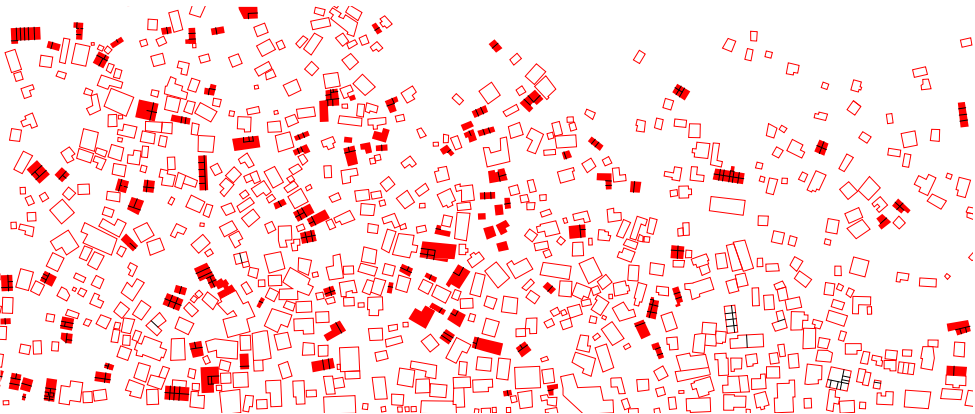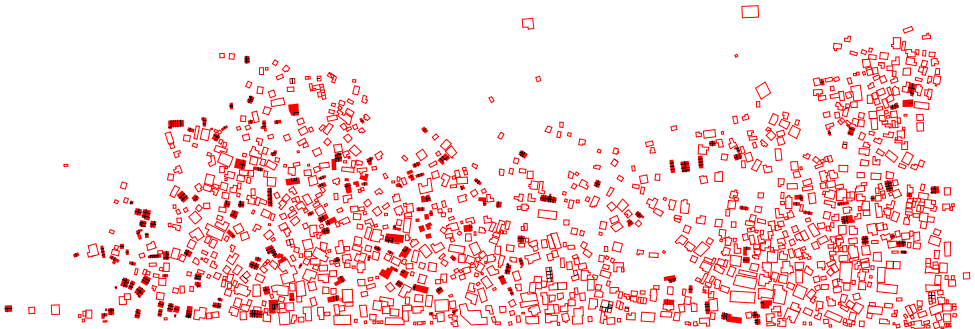
Interiors study

selected site
Google earth photo(2018)

Cyclone shelters instead of refugee camps and resettlements:

it can be mentioned that regarding relocations of slums occurs mainly because of annual cyclones, the author suggests implementations of public facilities that, in this case, can be counted as cyclone shelters instead of singles camps in another site far away from where people used to live.

• Cyclone shelters allow people to count cyclones and floodings as events rather than something that forces them to leave their homes.

• These buildings in the area will be 7 (400sqm) based on the standards of emergency shelters. They also can be multifunctional in moments of no flooding or cyclones.

• Activities like workshops, schools, community centers can be some examples of such functions.

Agriculture:

for centuries, agriculture was the main job in Beira. Women are mainly in charge of such activities(Afrofuturism). Agriculture in the site brings this opportunity for women to be more empowered.

River embracing and fishing market

One of the city's critical roles in history was its port connected to other countries and at the national level. With this approach, the neighborhood can obtain some qualities as listed below:
• A new yet already been taught way of transportation mainly when flooding occurs
• Fishing is the new possible job both for fishers and the market.
• Rivers can work perfectly well for flooding times in the neighborhood.

 It is suggested that the principles take place in the order of a timeline that is shown in the graphic p.171.

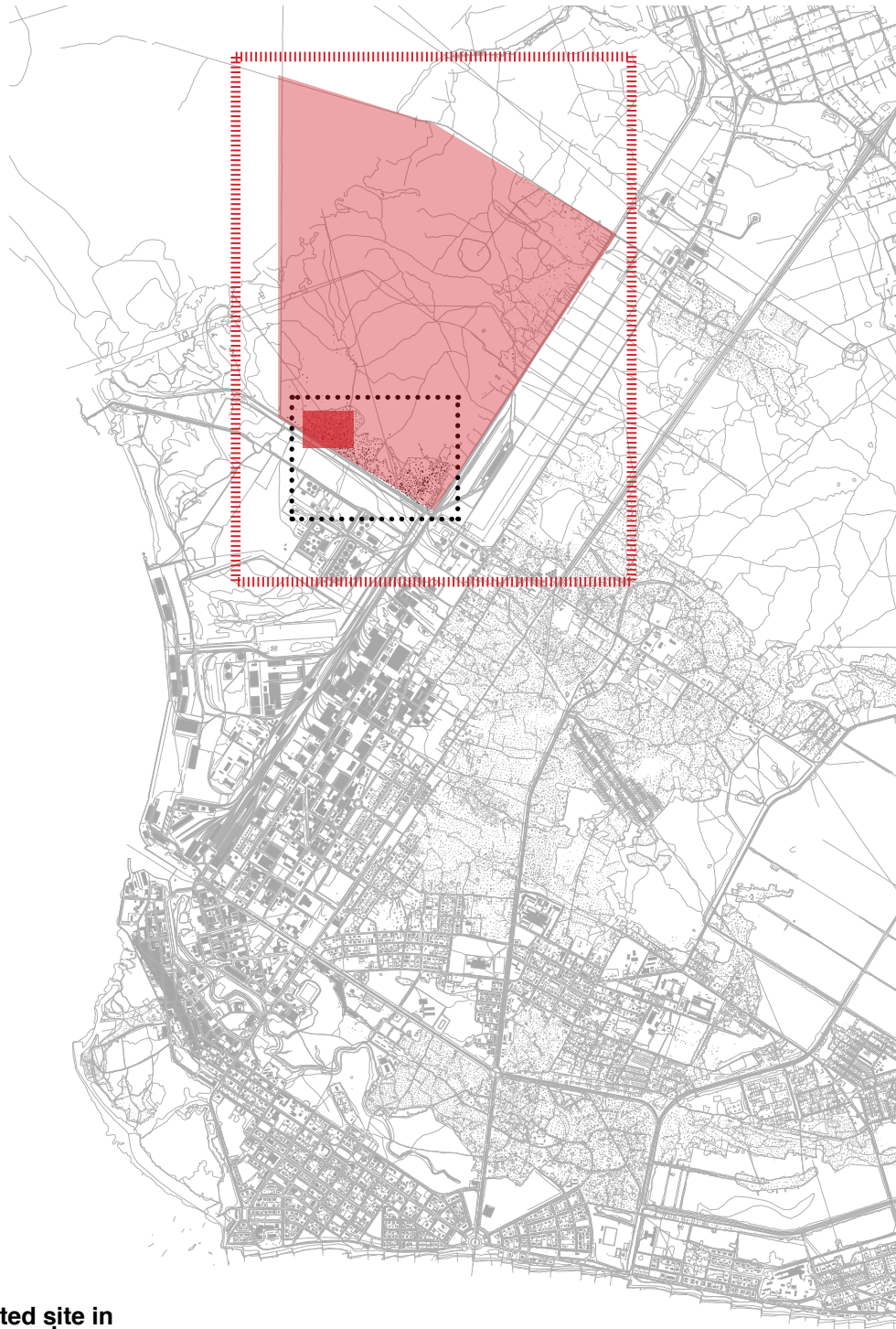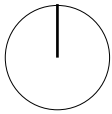**The functions that drainage and river brings to the site**

ref: Author

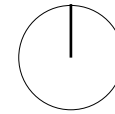Flooding management   transportation   Fishing and
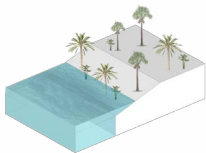
The existed drainage in the site
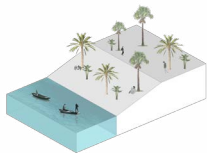
This drainage system is directly connected to the river that allows flooding to be managed.
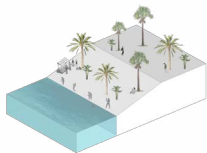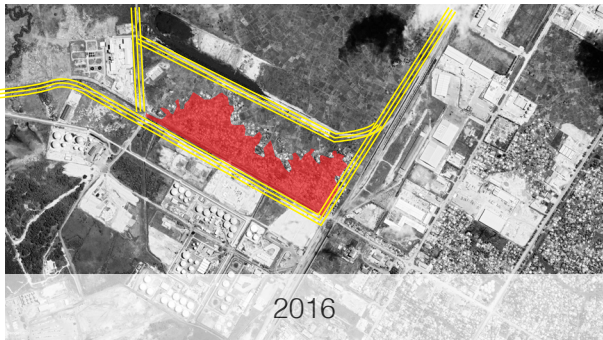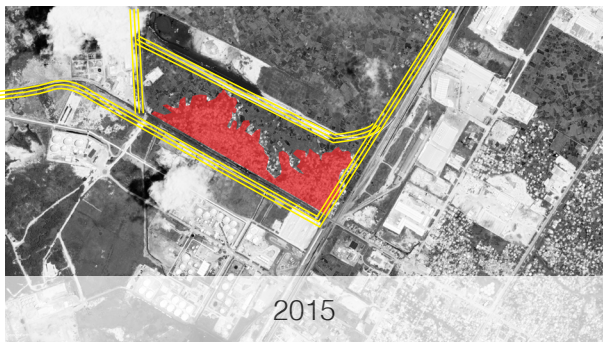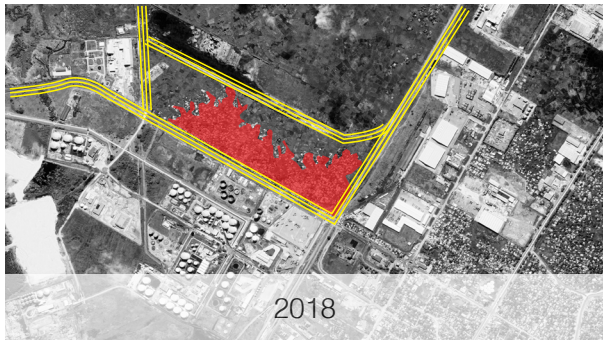
**Selected site in
urban scale**

Site Timeline

Studying through google map timeline demonstrates the expansion of the slums annually; given that this site is located in an industrial zone, the occupation is not well located. However, interviews verified the failure of relocation of people from this specific site.
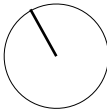

2004

2013

2017

2007

2014

2018

2009

2015

2019

2011

2016

2020

Selected site- 2018

Google street view

950 units
almost 3800 settlers

Selected site- 2021

google earth

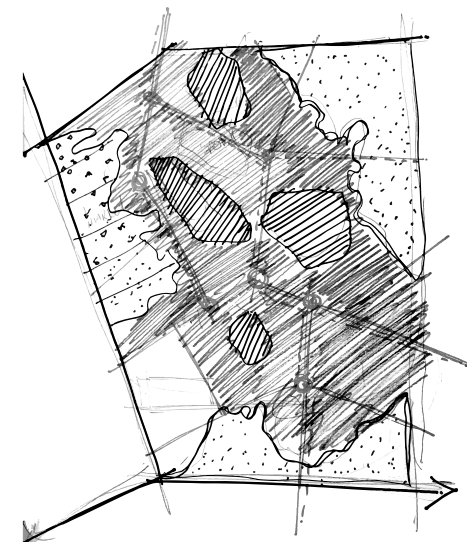**urban design strategies in the broader scale in the site**

The master plan in left shows the possible expansion of the strategies around the site.
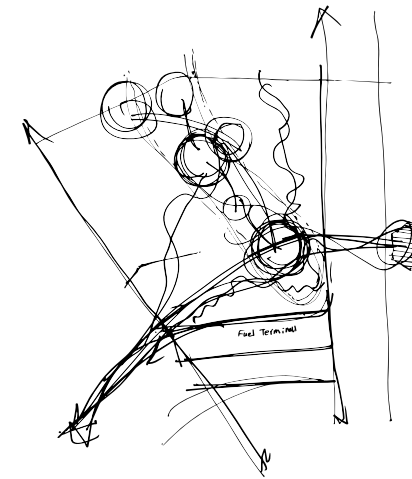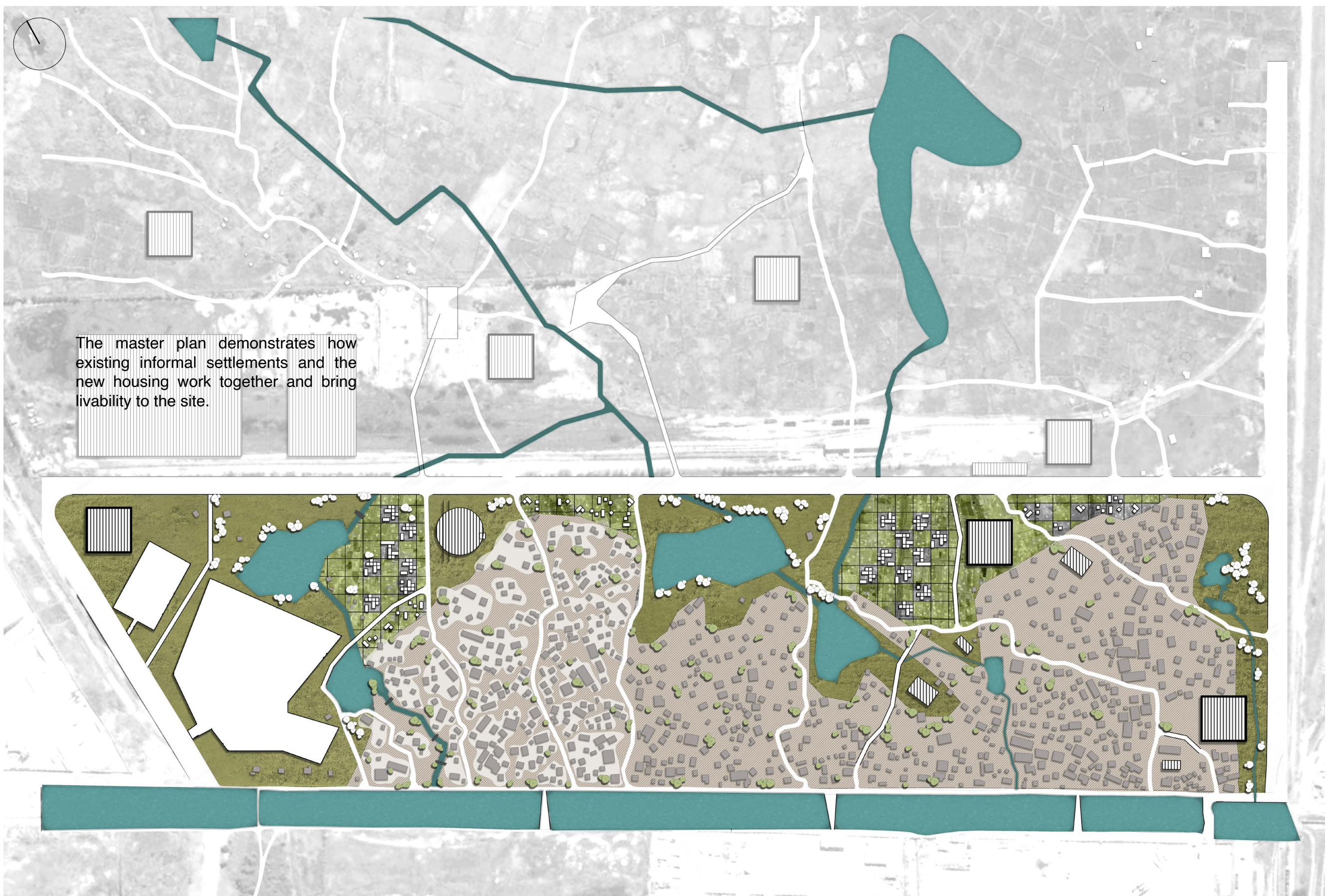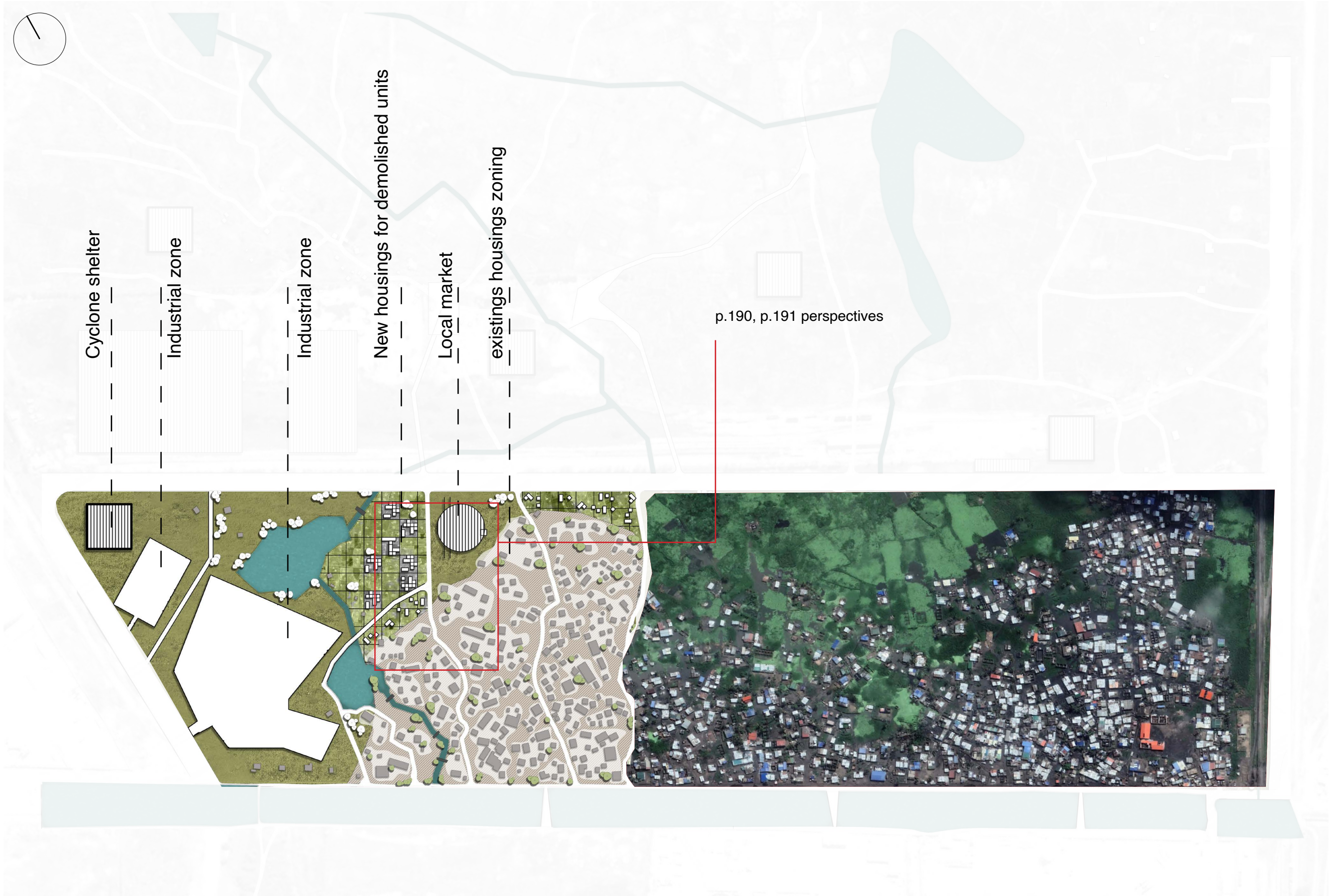
Water infrastructure connection
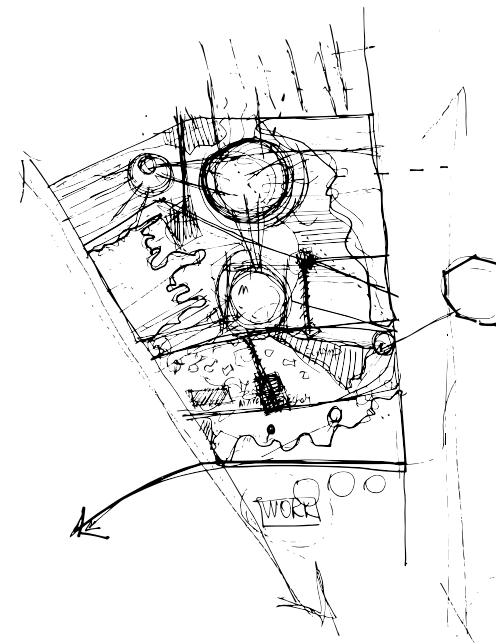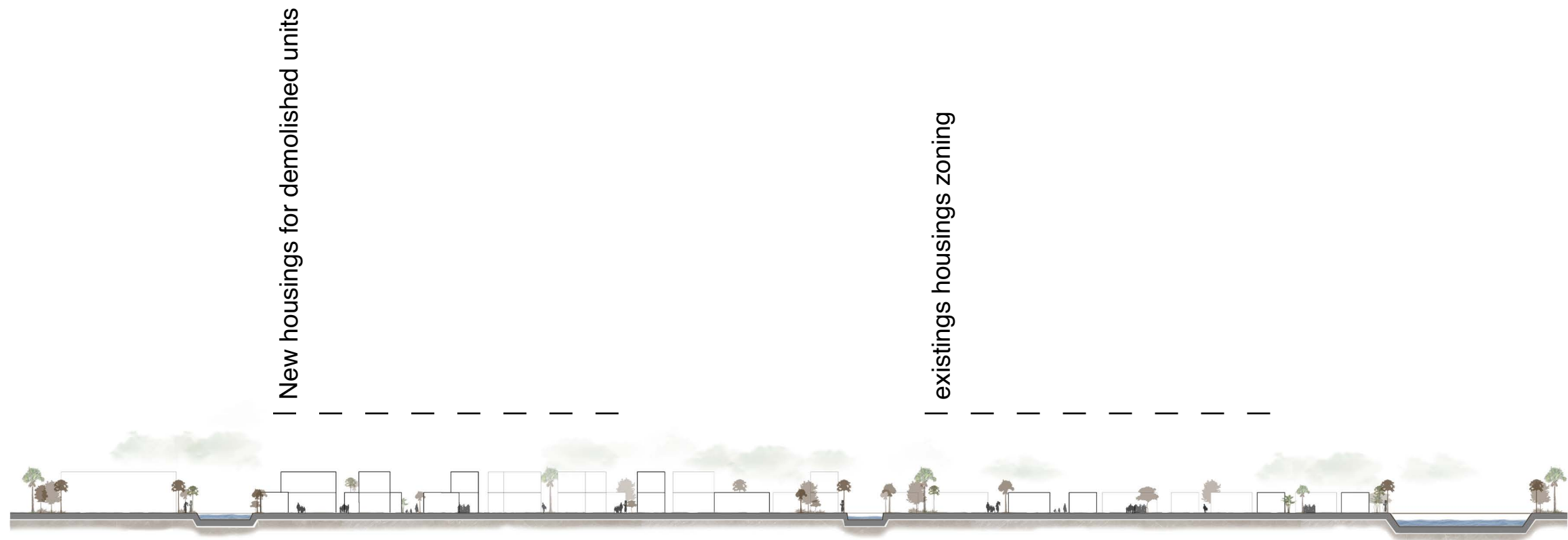
Future housing fabric expansion in the site

The main green area where the construction cannot be taken place due to the low quality of soil

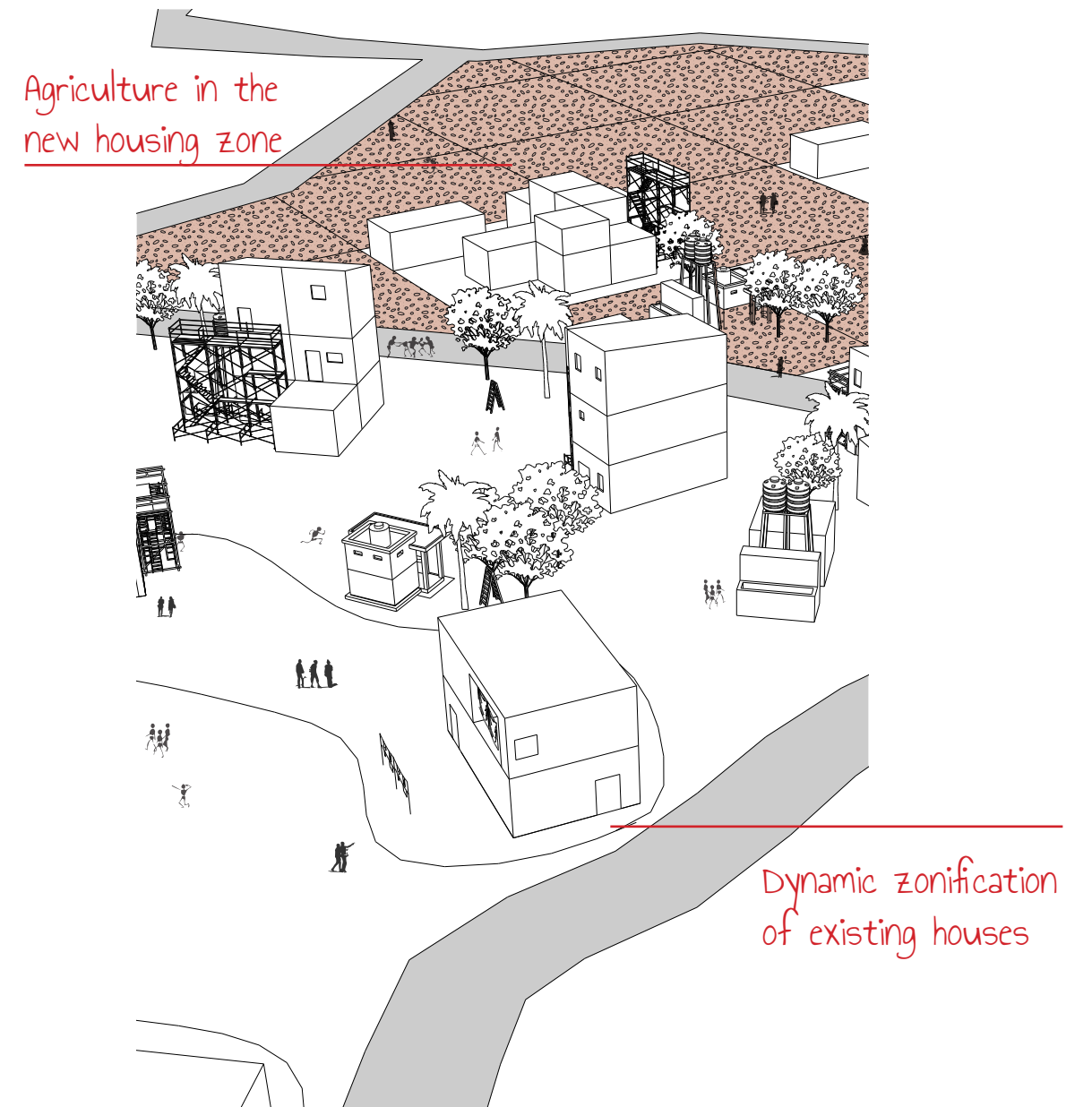The master plan demonstrates how existing informal settlements and the new housing work together and bring livability to the site.

Cyclone shelter

Industrial zone

Industrial zone

New housings for demolished units

Local market

existings housings zoning

p.190, p.191 perspectives

New housings for demolished units

existings housings zoning

**Urban section of
the selected site**

The section shows the
connection between each
element in the site

Local market

Public facilities

Agriculture in the
new housing zone

Dynamic zonification
of existing houses
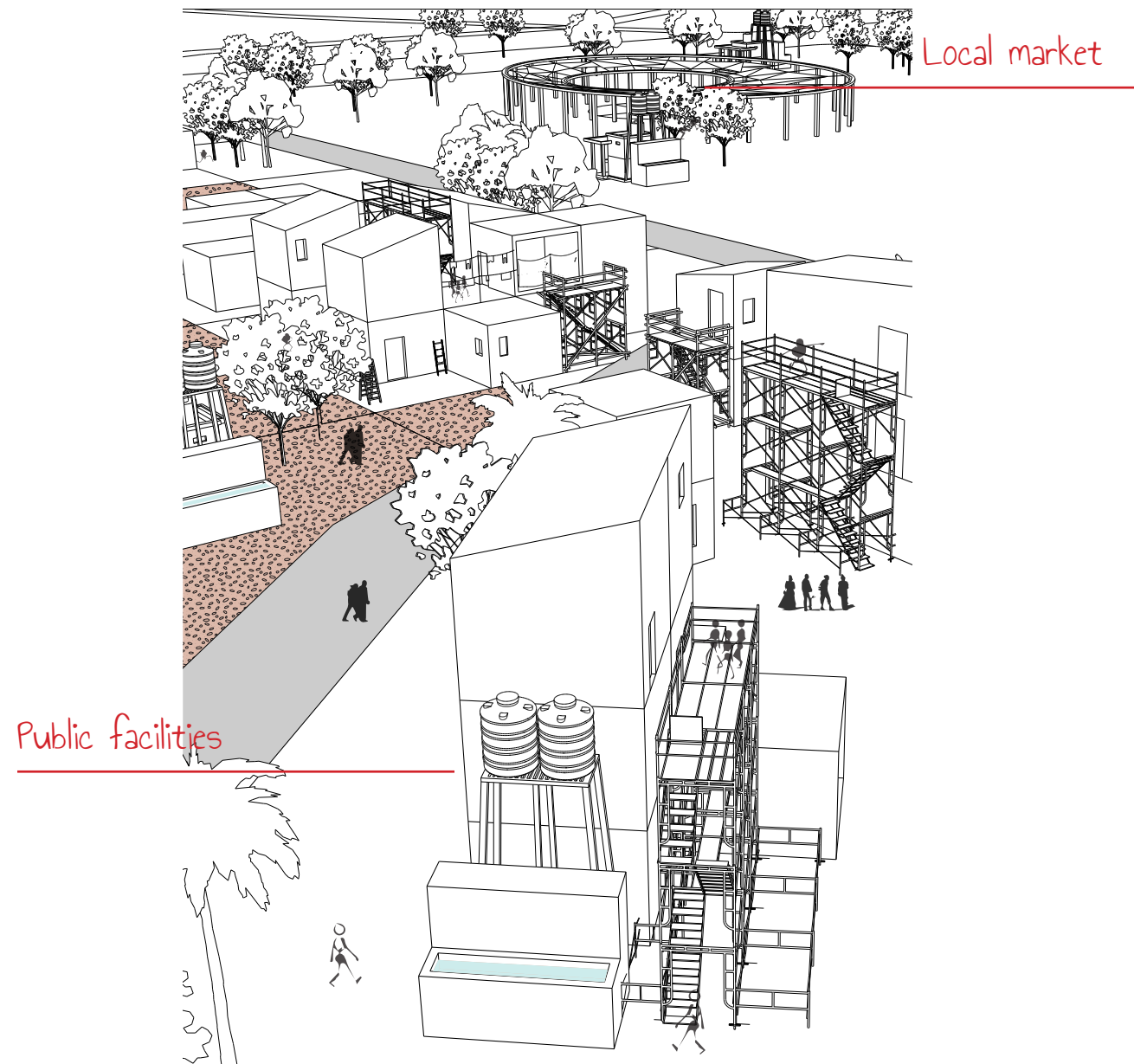
Public facilities

The need for potable water is more than critical in Beira. Therefore such facilities should be implemented as the first level of upgrading.

Local market

Fishing, agriculture, and women empowerment are the pillars of such a market. In the last report of UN-Habitat, the importance of the market has been noted as the basic infrastructure in upgrading.

First level vision of the site

short term

Second level vision of the site

long term