

ASSESSMENT OF VULNERABILITY AND RESPONSE TO COVID-19 IN THE MUNICIPALITIES OF MOZAMBIQUE

Results of Participatory
Planning and Mapping

In collaboration with the Urban Task Force for Response to COVID-19 in urban areas:

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Partner Municipalities



Main Partners



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Planning and Mapping



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1. INTRODUCTION

1.1 Context

More than 95% of all recorded cases of COVID-19 are in urban areas. In fact, the size of the urban population and the high number of global and local interconnections have made cities particularly vulnerable to the virus. Particularly, the impact of COVID-19 will be most devastating especially for the 1 billion people living in informal settlements in the world's poorest and most densely populated urban areas.

According to INFORM Epidemic Risk Index 2020, Mozambique was ranked as the 11th country in the world with the highest level of vulnerability to epidemics. In Mozambique, 76.9% of the urban population lives in overcrowded informal settlements, in housing with inadequate water and sanitation conditions, with crowded public transportation, and limited access to basic services and public health facilities.

The 2018 Afro-barometer survey indicates that up to 42% of urban households have no water access in their house or courtyard, 13% have no latrine, and 28% have no electricity supply. Also, in many urban areas of Mozambique families live in cohabitation with excessive household densification and several times the water supply is precarious, with frequent service interruptions. Therefore, preventive measures for COVID-19, such as hand washing, physical distancing and self-isolation, are often impossible in these areas. It is therefore very clear that there is a high risk that the impacts of COVID-19 on disadvantaged people in urban areas will be considerably higher

compared to other areas. Some heavily frequented urban locations and public spaces are also particularly at risk. This is due to the overcrowding combined with little access to handwashing facilities. In Mozambique, epidemiological reports from the cities of Nampula, Maputo, Beira, and Pemba, have shown that the urban areas most at risk are, among others, markets and public transports.

Thus, it is clear that planning at the municipal level is essential in the fight against COVID-19. For this purpose, mapping the most vulnerable areas proves to be an essential tool for the development of public policies and response plans at the local level. With this, innovative mapping and planning technologies can be used in the fight against the new coronavirus to support municipalities in their preparedness and prevention activities.

UN-Habitat worked with *Associação Mapeando Meu Bairro* in the context of the Urban Task-Force to support 12 municipalities of Mozambique in vulnerability mapping and strategic planning for COVID-19 response, through a participatory approach. This was done with the aim of prioritizing sites and interventions to promote access to water, sanitation and hygiene and information access in vulnerable urban locations with a focus on informal settlements. These innovative tools will enable a concrete response to COVID-19 in the Municipalities, based on real and verified data.

1.2 Objective

The objective of the publication is to present the results of the participatory planning and vulnerability mapping work for the prevention and response to COVID-19 at urban level, developed with 12 Municipalities of Mozambique. This is in order to firstly disseminate good practices on tools and initiatives to fight the pandemic in urban areas and secondly to trigger reflections on the urban areas vulnerabilities and possible areas of improvement.



2. METHODOLOGY

2.1 Vulnerability Mapping

To realize the vulnerability mapping, a multi-criteria approach was adopted that allowed to realize COVID-19 vulnerability maps of 12 Municipalities at neighborhood level, focusing on access to water, hygiene and sanitation.

The objective was twofold:

- Provide planning tools to Municipalities and possible partners to prioritize their interventions to strengthen access to water, hygiene and sanitation and awareness information in urban areas with a focus on informal settlements, as well as access to COVID-19 prevention information;
- Build capacity in the Municipalities with a focus on municipal technicians in data collection for COVID-19 vulnerability mapping with innovative and easily accessible tools.

The methodology used was comprehensive and participatory and relied on several phases, namely:

- Identifying vulnerability criteria*
- Preliminary analysis*
- Survey of existing data*
- Survey of new data and training of municipal technicians*
- Final multi-criteria analysis*
-

Key criteria have been identified on the basis of international good practice to identify levels of vulnerability. They are:

- Population Density
- Prevalence of Informal Settlements
- Lack of access to water and sanitation
- Lack of access to reliable information
- Presence of high-density public spaces such as markets, terminals, and public spaces.

The data sources used were of two typologies: Firstly, existing data, surveyed through online databases (OpenStreetMap, HumDATA) and INE data with the 2017 Census; Secondly, new data identified through satellite photos restitution, telephone interviews with municipal technicians and field surveys.

The field surveys were carried out with a participatory approach by Municipal technicians from the 4 pilot cities of Dondo, Beira, Boane and Maputo. They were previously trained in the use of innovative field mapping tools such as the OMS Tracker application and Open Street Maps, that supported in the formulation of the survey to the residents of type zones of the selected neighborhoods.



Training of Maputo Municipal technicians in vulnerability mapping to COVID-19 with open data

The final result consists of 12 maps with:

- 5 levels of vulnerability for the classification of neighborhoods, based on previously selected criteria
- 2 levels of vulnerability for the classification of the main agglomeration areas (markets and terminals) on the basis of selected criteria like users turnout and access to water and sanitation



Training of Boane Municipal technicians in field mapping with open data

FOCUS ON VULNERABILITY FACTORS

1. POPULATION DENSITY

People who live in and frequent areas with high population density, such as urban and metropolitan areas and in particular informal settlements are more likely to contract the virus, being a communicable disease. Markets, public spaces, public transports and bus stops or terminals are places with high risk of exposure, as demonstrated by the sero-epidemiological surveys conducted in Mozambique's main cities.

2. PREVALENCE OF INFORMAL SETTLEMENTS

Informal settlements are places with high population density, inadequate housing condition, and insufficient access to adequate basic services such as water, hygiene, and sanitation. A high number of people living in small houses or single rooms poses challenges for the isolation of sick people, or simply for social distancing, since it is difficult for people to stay long in overcrowded housing. In addition, the requirements for social distancing and closing off public spaces are likely to put substantial pressure on individuals living in these conditions. Spending more time in such houses may increase vulnerability to other medical conditions and is likely to induce substantial psychological strain. Precarious housing of traditional materials can also generate challenges in maintaining adequate hygiene standards.

3. LACK OF ACCESS TO WATER

Maintaining proper preventive hygiene, such as regular hand washing with soap and water, is the best way to protect against COVID-19. It is likely to be more difficult in households without access to piped water at home or in overcrowded spaces such as markets and terminals.

Households dependent on unimproved water sources are also at risk of contracting other waterborne diseases such as cholera, increasing the overall likelihood of needing other medical care.

At the same time, having access to piped water and shared water resources in neighbors' backyards or public wells can lead to additional risks being places that can generate crowding, difficult cleaning and limit the effectiveness of any quarantine.

4. POOR SANITATION

Sharing sanitation facilities among several people or households limits the effective enforcement of social distancing, forcing interactions and making it difficult to maintain an adequate level of hygiene, especially in case of absence of water sources in the surroundings. Inadequate sanitation is also a source of other infectious diseases that can compromise recovery from COVID-19. Additionally, according to the WHO, sanitation facilities, both public and private, should be accompanied by the presence of handwashing points within 5m of distance.

5. LACK OF ACCESS TO INFORMATION

Access to information is critical for communities to understand the importance of social distancing and preventive hygiene and to have the knowledge of how to properly implement the measures outlined by the government. Connectivity through the Internet, television or radio means that information is reliable and official and can reach the household without any direct human contact. In addition, having easy access to information, education and entertainment at home is likely to make it easier for households to practice social isolation.

2.2 Priority Action Matrix

In parallel to the elaboration of the vulnerability maps to COVID-19, a participatory planning exercise was conducted to support the Municipalities in developing strategies and prioritizing interventions in key locations for fighting the pandemic. This with a focus on the components of coordination and planning, promotion of access to water, hygiene and sanitation, and access to information and awareness. The action plan can also serve as a fundraising tool with potential donors and for partners to identify priority areas to support municipalities.

The final aim of the activity was to strengthen the Municipalities' capacity to plan and prepare to face the pandemic by strategically prioritizing immediate, practical activities to improve access to water, hygiene and sanitation, and information in places and for the most vulnerable populations in the city in the short, medium and long term. The action plan focuses on three key pillars, following the key vulnerability criteria of the maps, i.e. focusing on:

- **Institutional coordination and planning;**
- **Water, sanitation and hygiene and urban planning;**

- **Awareness and community engagement.**

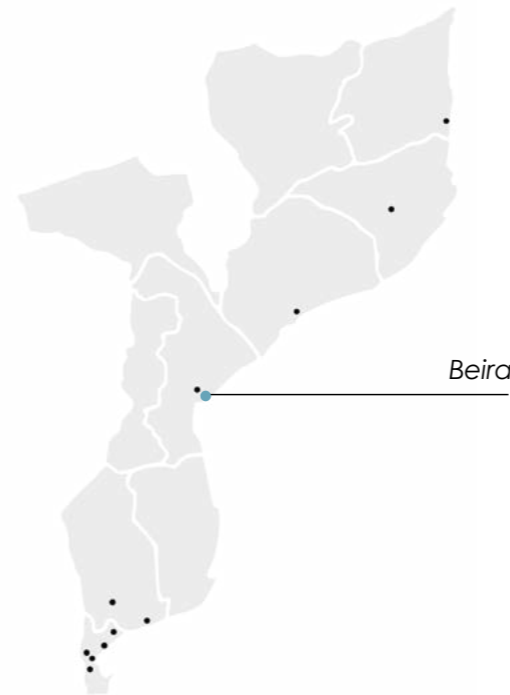
To support the Municipalities in the elaboration of the action plans, an inclusive and simplified tool was elaborated based on strategic questions that allowed to focus on the prioritization of maximum 6 actions within the three pillars described above. The action plans were elaborated in a participative way by the Municipalities with monitoring by the Urban Task Force technical team, according to the participative methodology of the designed tool.

The two participatory planning and mapping exercises are complementary, with the mapping serving to support the Municipalities in identifying priority sites for action implementation. It also may serve to further feed into the action plan on the basis of Municipalities' priorities and needs. At the same time, the planning results served as validation of the sites identified as most vulnerable in the vulnerability maps.



3.VULNERABILITY PROFILES

3.1 Beira Municipality



Beira Municipality has 590,293 inhabitants and a population density of 935 inhabitants per km². Beira is a coastal city, capital of Sofala Province and considered to be the second largest city in the country.

In March 2019, the city had about 90% of its extension destroyed by Cyclone Idai and it is still in the process of recovery and reconstruction. Between late 2020 and early 2021 it was again affected by Tropical Storm Chalane and Cyclone Eloise, which caused even more infrastructure destruction. In addition to having an effect on the coverage of public services that no longer cover the entire city, this also has direct consequences on the population vulnerability to COVID-19 in terms of precarious housing, insufficient livelihoods, poor access to water and hygiene among others. The emergency of overcrowded reception centers for victims of Cyclone Eloise makes social distancing and continuous and appropriate access to water and hygiene materials difficult, thus presenting an even greater risk for the increase of cases of COVID-19 in the city.



592,090
inhabitants



935 inhab/Km²
density



53,9% people with
private access
to water*
à água*

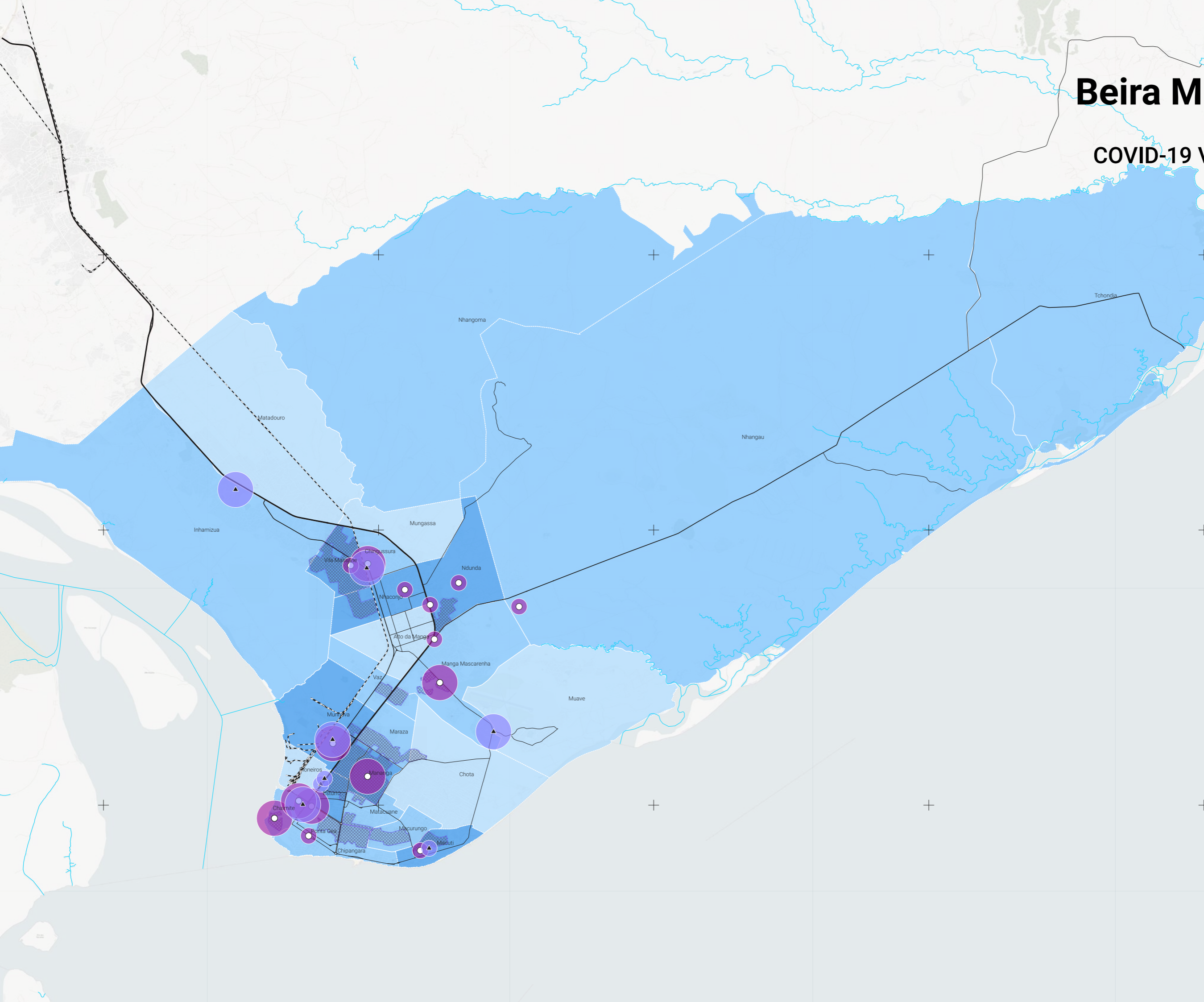
As evidenced in the COVID-19 vulnerability map of Beira City, the Municipality has a city center with a greater presence of informal settlements and a higher concentration of high density neighborhoods. Thus, unplanned and uncoordinated urban development negatively affects the living conditions of Beira residents, especially in flood-prone areas. Agglomeration sites such as markets, transport terminals, and public spaces are also located in the city center, with the most vulnerable placed in the Munhava and Chaimite neighborhoods, among others.

At the same time there are vast peri-urban areas with low population density characterizing a dispersed urban growth with less access to services but greater dependence on public transport to reach the city center. According to the analysis of vulnerability to COVID-19 of the Municipality of Beira, after crossing several factors, it resulted that the neighbourhoods with the highest level of vulnerability are located in the city center, due to the above-mentioned factors, highlighting Munhava, Macuti, Ndunda, Vila Massane and Nhaconjo as the most vulnerable. At the same time, some peri-urban neighborhoods such as Nhangoma and Tchonja show medium levels of vulnerability, due to poor access to basic services that can guarantee adequate protection by COVID-19. According to the preliminary results of the Sero-Epidemiological Survey of October 2020, the neighborhoods considered on the map as the most vulnerable were in fact the neighborhoods with the highest number of registered cases in the city.

(*) By "private access to water" is meant safe access to piped water in the household's own yard or inside the house. The remaining percentage indicates access to shared water sources (wells etc.) or to water from unsafe sources

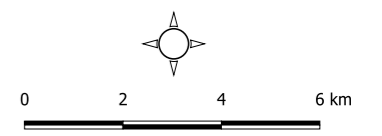
Beira Municipality

COVID-19 Vulnerability Map



LEGENDA

- Unidades Sanitárias
- Mercados**
 - Vulnerabilidade Baixa
 - Vulnerabilidade Alts
- Terminais**
 - Vulnerabilidade Baixa
 - Vulnerabilidade Alta
- Rios
- Linha Férrea
- Rede Viária**
 - Vias Principais
 - Vias Secundárias
 - Vias Terciárias
- Assentamentos Informais
- Níveis de Vulnerabilidade**
 - Baixo
 - Médio-Baixo
 - Médio
 - Médio-Alto
 - Alto








3.2 Boane Municipality



Boane Municipality has 105,290 inhabitants and a population density of 178.6 inhabitants per Km². The Municipality is part of the Maputo Metropolitan Area, together with the cities of Maputo, Matola and Marracuene, and is the most extensive but least populated of the Municipalities in the Area (6% of the total). The District of Boane is predominantly agricultural and rural and has the lowest level of physical and socioeconomic development in the region, although it has a considerable level of electricity network coverage, as well as water supply and communication network, relevant factors to ensure adequate access to hygiene and COVID-19 prevention messages.

Although the level of urbanization and territorial and socioeconomic development of the area is still low, the city presents several informal settlements dispersed in many neighborhoods with a medium-high population density rate, mainly located in the neighborhoods of Gima, 25 de Julho, Marien Nguasi and Eduardo Mondlane.

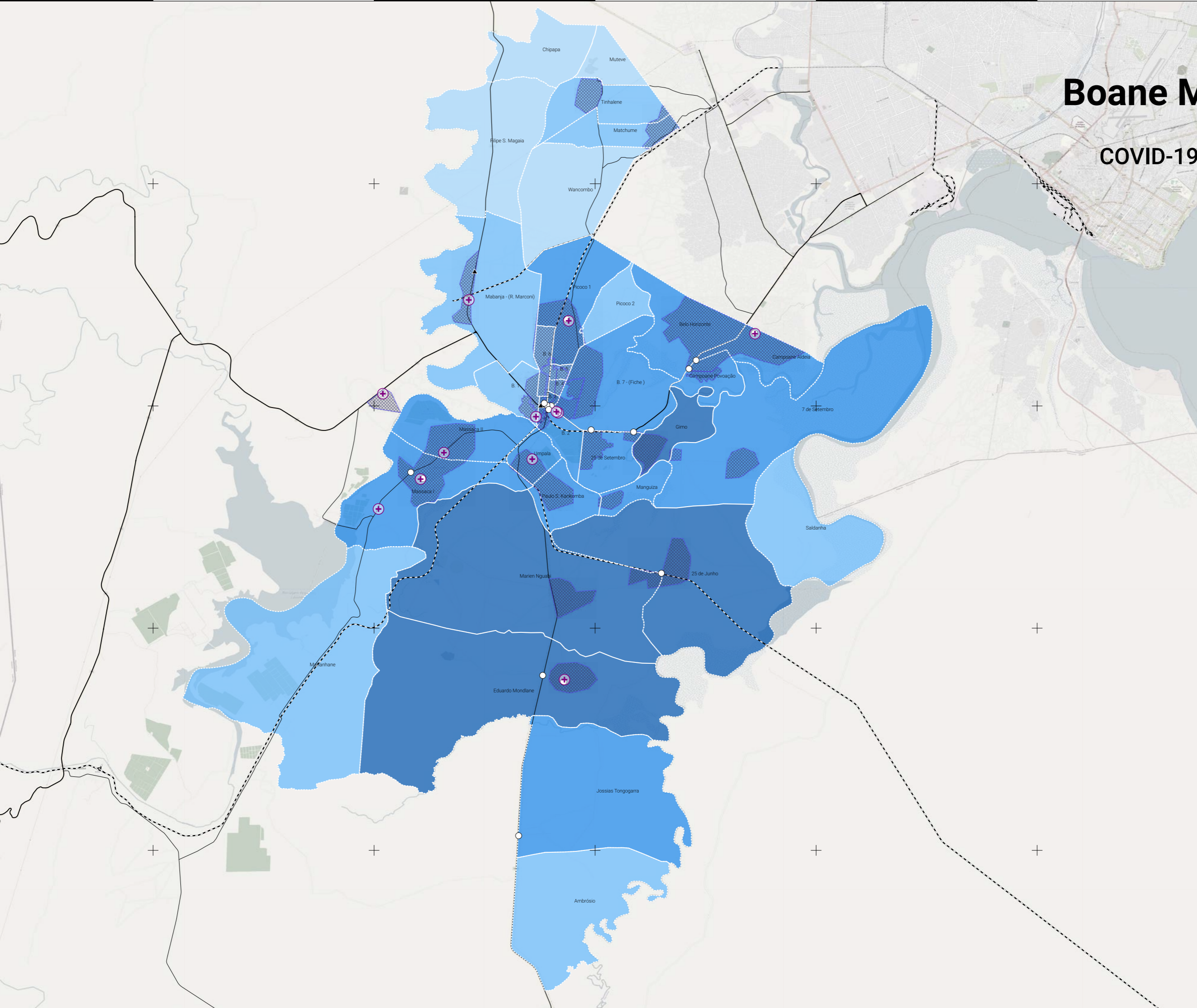
- 
105,290 inhabitants
- 
178,6 inhab/Km² density
- 
44% people with private access to water

As evidenced in the vulnerability map of Boane Municipality, this factor contributes to high vulnerability indices, along with weaker access to water, hygiene, and sanitation services compared to the rest of the region. The results show that the most vulnerable neighborhoods identified are the four with the highest presence of informal settlements, as well as markets and public services with the highest concentration of people. Overall, the mapping for Boane Municipality showed a higher than average level of vulnerability: the city has 5 neighborhoods with High vulnerability and 6 with Medium-High level.

The area's transport infrastructure relies mainly on local secondary roads and only 5.9% of households own cars, thus evidencing a high dependence on public transport, potential drivers of COVID-19. In addition, Boane Municipality is crossed by the National Road N2, one of the major economic corridors in the country, travelled daily by several national and international carriers transporting goods between South Africa and Mozambique.

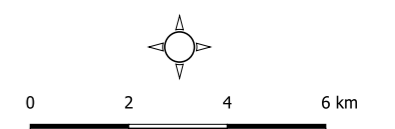
Boane Municipality

COVID-19 Vulnerability Map



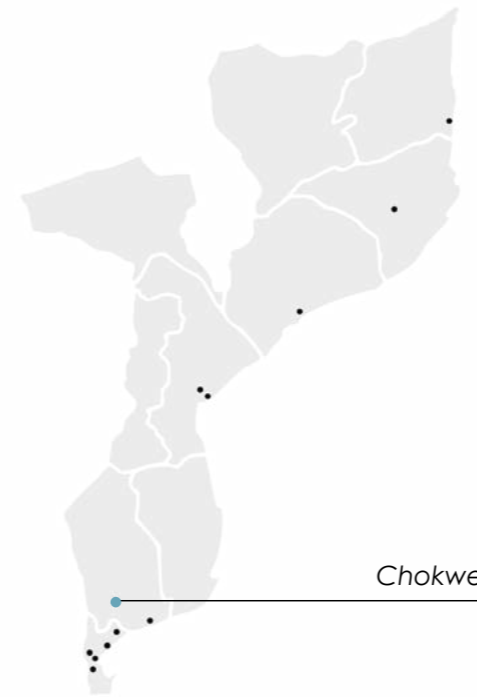
LEGENDA

- unidades sanitárias
- Mercados
- Terminais
- assentamentos informais
- Rede Viária**
 - Primárias
 - Secundárias
 - Terciárias
 - Linha Férrea
- Níveis de Vulnerabilidade**
 - Baixo
 - Médio-Baixo
 - Médio
 - Médio-Alto
 - Alto








3.3 Chókwè Municipality



Chókwè Municipality has approximately 67,913 inhabitants and a population density of 485 inhabitants per km². Chokwè has a relatively small and centralized urbanized area, but shows rapid but unplanned development, with the presence of localized informal settlements. The city is usually affected by various natural hazards such as floods, droughts and cyclones, especially in the Limpopo region. Here, in fact, the most vulnerable zones are unplanned urbanized areas, mainly informal settlements and areas of unplanned occupation, which also have a higher rate of vulnerability to communicable diseases such as COVID-19.

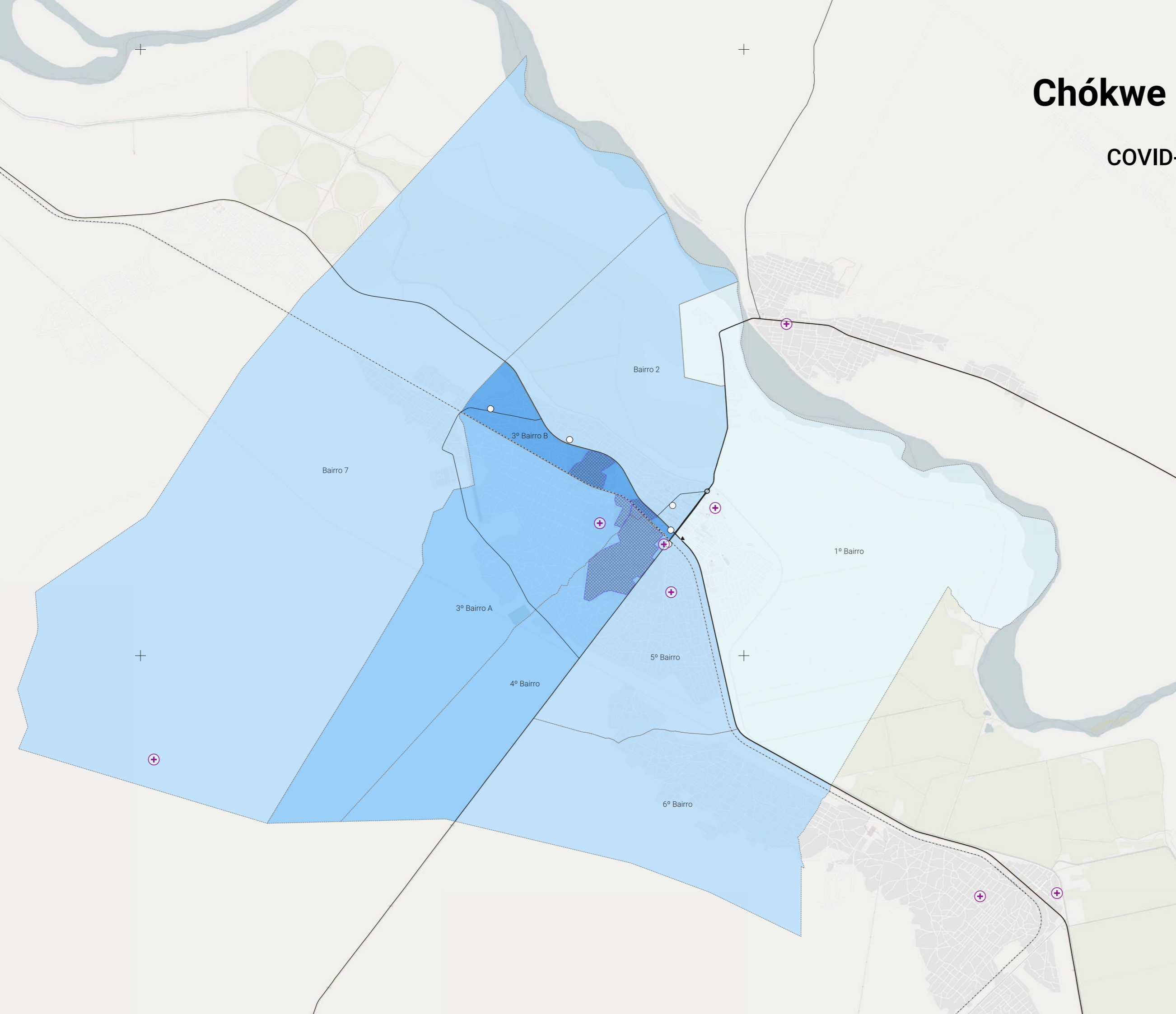
The central urbanized zone of the city has some informal settlements and the main public services, while around it there are several peri-urban neighborhoods, with a lower population density and a lower level of vulnerability. In general, the city presents a medium-low level of vulnerability to COVID-19, with the exception of the 3° Bairro B which presents a medium-high level of vulnerability. This is due, among other factors, to the relatively low rate of informal settlements and good access to safe water sources at the household level, with 81.9% having access to safe water sources not shared with other households (INE 2017). This is a relevant rate, similar to the Municipality of Maputo, that is the country's capital city.

Chókwè is an important commercial hub in Gaza province, which implies the passage of several carriers potentially carrying COVID-19 from other provinces, as demonstrated by the Sero-Epidemiological Survey that ranks carriers as the professional category with the highest rate of exposure to COVID-19 (16.1%). In addition, the 43% of the population does not own any means of transportation (car, motorcycle, or bicycle) which may constitute a high risk of contagion for populations in informal settlements, that have less access to other means of transportation and less financial conditions for social isolation.

- 
67,913 inhabitants
- 
485 inhab/Km² density
- 
81,9% people with private access to water

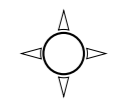
Chókwe Municipality

COVID-19 Vulnerability Map



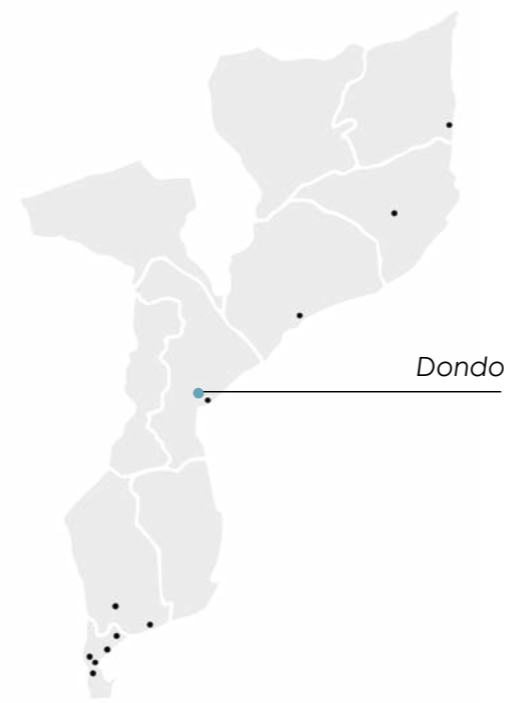
LEGENDA

- Unidades Sanitárias
- Mercados
- Terminais
- Rede Viária**
- Vias Primárias
- Vias Secundárias
- Vias Terciárias
- Linha Férrea
- Assentamentos Informais
- Limites dos Bairros
- Níveis de Vulnerabilidade**
- Baixo
- Médio-Baixo
- Médio
- Médio-Alto
- Alto





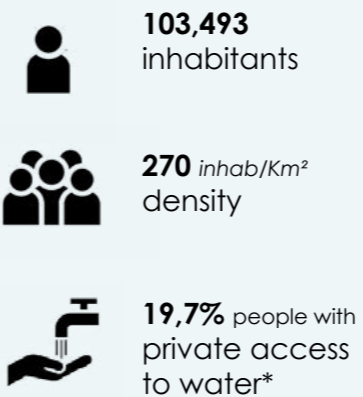
3.4 Dondo Municipality



The city of Dondo has about 103,493 inhabitants, with an area of 380 km² and a population density of 270 inhabitants per km². It is a city with industrial, logistical and agricultural characteristics and one of the most important settlements of the Beira Corridor - EN6, which connects the Port of Beira to the hinterland countries. The city has relatively high growth rates, due to its connection to the city of Beira, the increase of residents caused by the high costs of living in the neighboring city, and the increase in the frequency of disasters due to the effects of climate change in the region. Although it is growing, the city still has a strong dependency on the city of Beira.

Dondo City consists of 10 Neighborhoods, of which 9 have informal settlements, thus presenting a greater lack of access to basic services and adequate housing which may hinder access to an adequate level of preventive hygiene and the possibility of quarantine. Importantly, the vulnerability of these areas is exacerbated by the high exposure to natural hazards such as flooding, flooding, and cyclones or high winds, as demonstrated by Cyclone Idai in 2019, which may further impact the quality of hygiene and adequate spaces to practice social distancing.

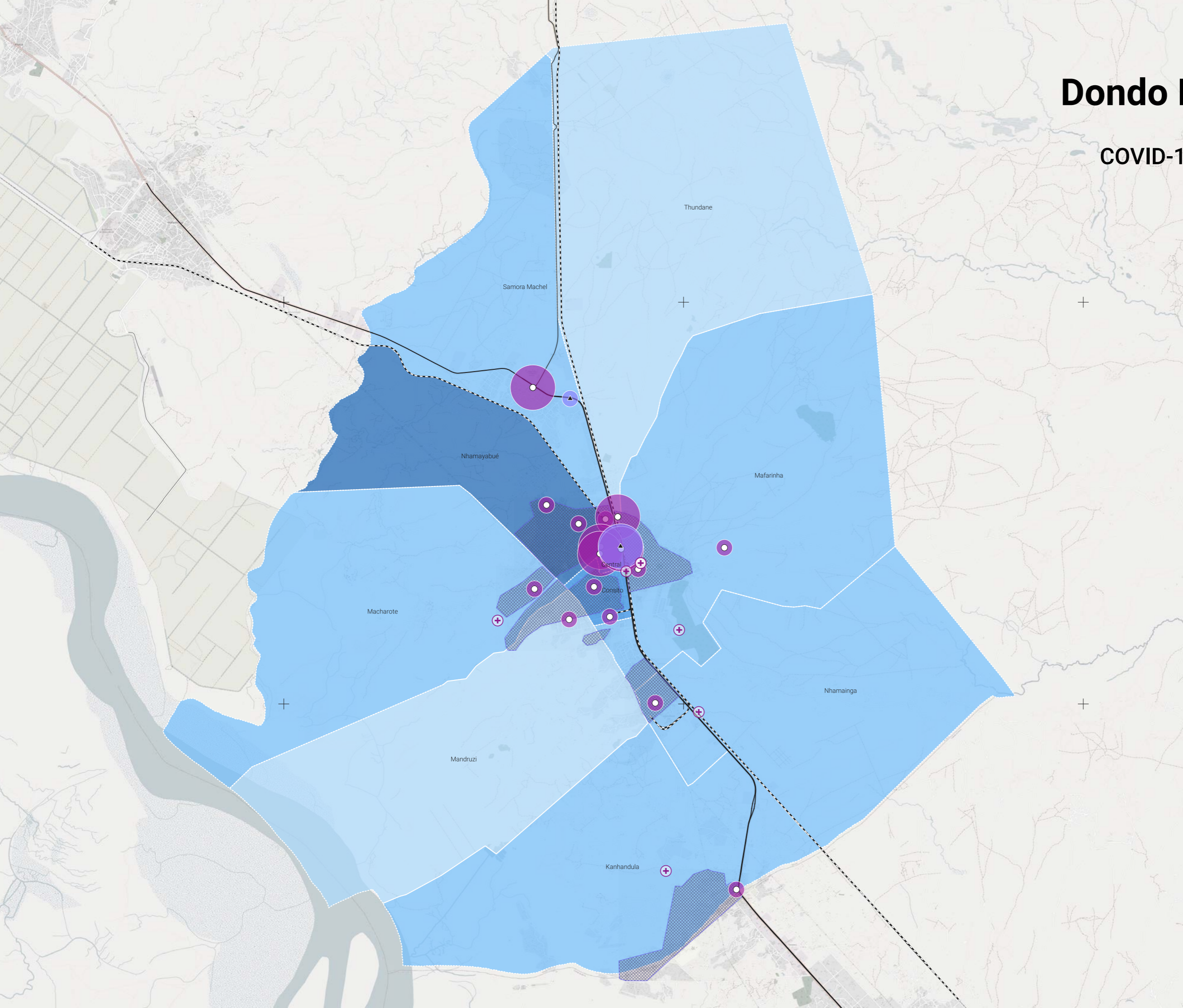
The vulnerability analysis of the Dondo Municipality as reported in the vulnerability map, presents a medium or medium-low vulnerability index, similar to that of the Municipality of Chókwè and Manhiça. As in these two cities, although the component of access to water and sanitation is still quite weak compared to the other more urbanized cities (with the exception of Chokwè), the vulnerability index is mainly a result of the presence of a vast peri-urban area combined with the relatively low population density, results of the dispersed urban expansion in the Municipality, as well as the absence of a high number of public spaces, primarily concentrated in the city center. The City of Dondo, in particular, presents only one transportation terminal in the city center, which connects the Municipality with Beira City.



(*) Data at District level (census INE 2017)

Dondo Municipality

COVID-19 Vulnerability Map



LEGENDA

Unidades Sanitárias

Espaços Públicos

Terminais

Vulnerabilidade Baixa

Vulnerabilidade Alta

Mercados

Vulnerabilidade Baixa

Vulnerabilidade Alta

Assentamentos Informais

Rede Viária

Estrada Nacional

Vias Primárias

Vias Secundárias

Vias terciárias

Linha Férrea

Níveis de Vulnerabilidade

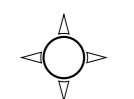
Baixo

Médio-Baixo

Médio

Médio-Alto

Alto



0 1 2 3 km





3.5 Manhiça Municipality



Manhiça Municipality has 77,098 inhabitants, a surface area of 450 km² and a population density of 171 inhabitants per Km². As in the case of Dondo and Manhiça, it presents a localized urban area, with most peri-urban neighborhoods that are predominantly rural areas with low population density. The urban center of Manhiça is crossed by the National Road EN1 and the railway and presents some informal settlements.

The majority of the population is concentrated in these central neighborhoods that resulted as the most vulnerable, such as Ribangua, Manhiça Sede, Nwacanana and Washinengane, among others. The majority of the houses in Manhiça have walls made of local materials such as reeds, sticks, bamboo or palm trees (68.6%) and only 19.8% have cement block walls, which can translated into a certain amount of precarious housing and inadequate locations that create challenges in case of eventual need for isolation or social distancing. As Dondo, Manhiça also presents a relevant challenge related to access to water and sanitation, since only 55.8% of the dwellings have access to piped water inside the house, and 7% of households do not yet have access to safe water sources, which can lead to other diseases such as cholera, in addition to the increased risk of contagion from COVID-19 due to insufficient access to water for proper hand hygiene

These data allowed to obtain a map that shows not very homogeneous levels of vulnerability at the city level, with peri-urban neighborhoods with low vulnerability, up to central neighborhoods with high levels of vulnerability.



77,098
inhabitants



171 inhab/Km²
density



55,8% people with
private access
to water

Manhiça Municipality

COVID-19 Vulnerability Map

LEGENDA

⊕ Unidades Sanitárias

★ Espaços Públicos

Terminais

▲ Vulnerabilidade Baixa

▲ Vulnerabilidade Alta

Mercados

○ Vulnerabilidade Baixa

○ Vulnerabilidade Alta

▨ Assentamentos Informais

Rede Viária

— Estradas Nacionais

— Vias Primárias

- - - Linha Férrea

⋯ Limites dos Bairros

Níveis de Vulnerabilidade

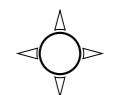
□ Baixo

□ Médio-Baixo

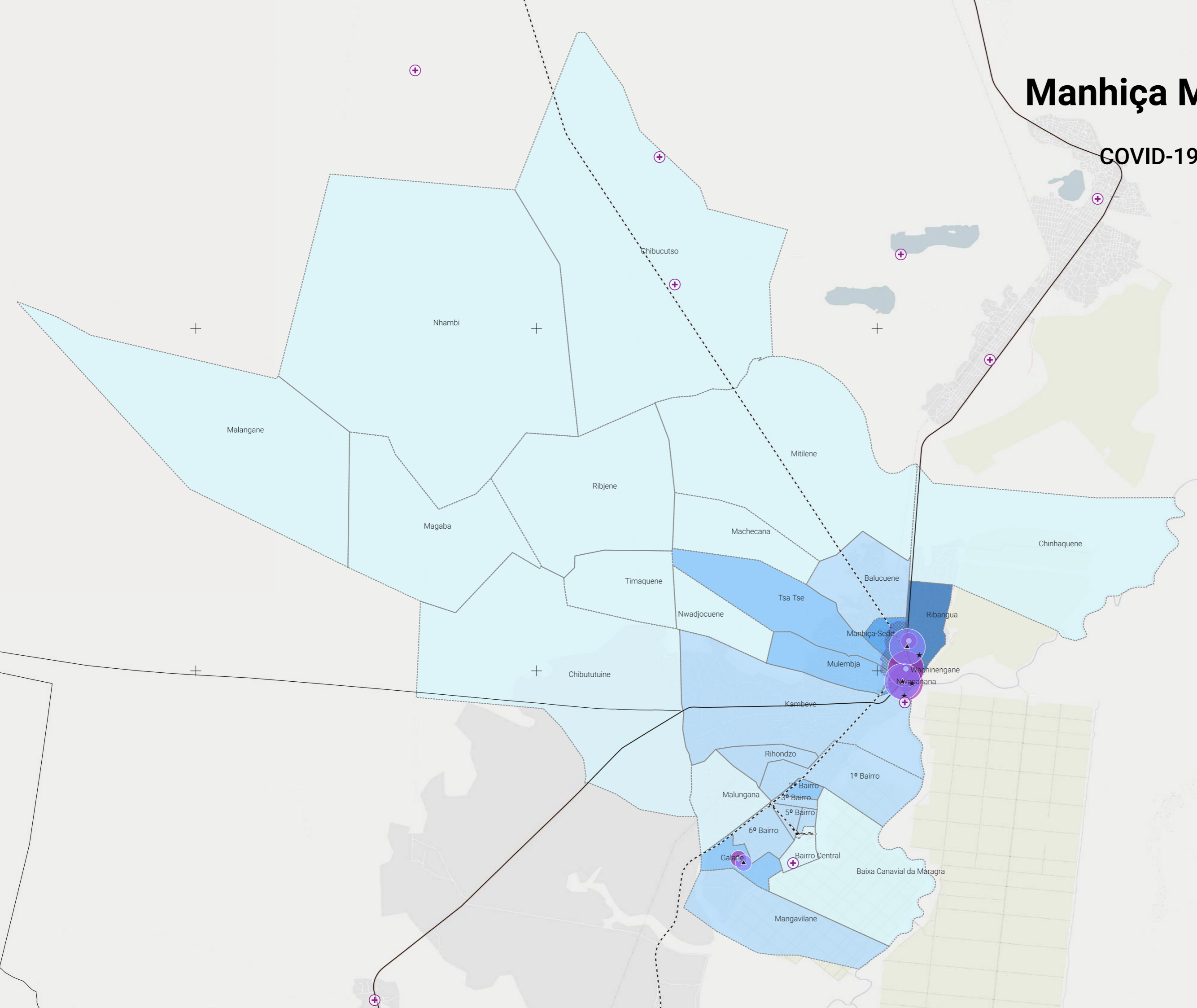
□ Médio

□ Médio-Alto

□ Alto



0 1.5 3 4.5 km





3.6 Maputo Municipality






The population of Maputo, the capital city of Mozambique, continues to grow at a rapid pace as a result of high birth and immigration rates. According to the most recent data, there are now about 1,124,988 people living in the city, which poses enormous challenges to the local authority in its efforts to deliver basic services, provide food, and improve the city's infrastructure. Maputo Municipality has a population density of 3,589 inhabitants/km² and has vast areas of informal settlements.

Residential areas represent approximately one third of the land use in Maputo. Large portions of land are devoted to single-family residences established in unplanned urban settings driven by extensive dispersed urban sprawl that lacks basic infrastructure and public services and presents a greater risk in the event of an outbreak of COVID-19 in these high population density localities.

In particular, there are several areas that need proper planning, i.e., areas that lack legal security of use, demarcation, and registration in the municipal cadastre. This situation makes it difficult for users to access services such as water and power distribution networks, which is a consequent challenge in preventing COVID-19 in informal settlements in a densely populated city. Still 16% of people do not have access to personal/unshared or safe water sources.

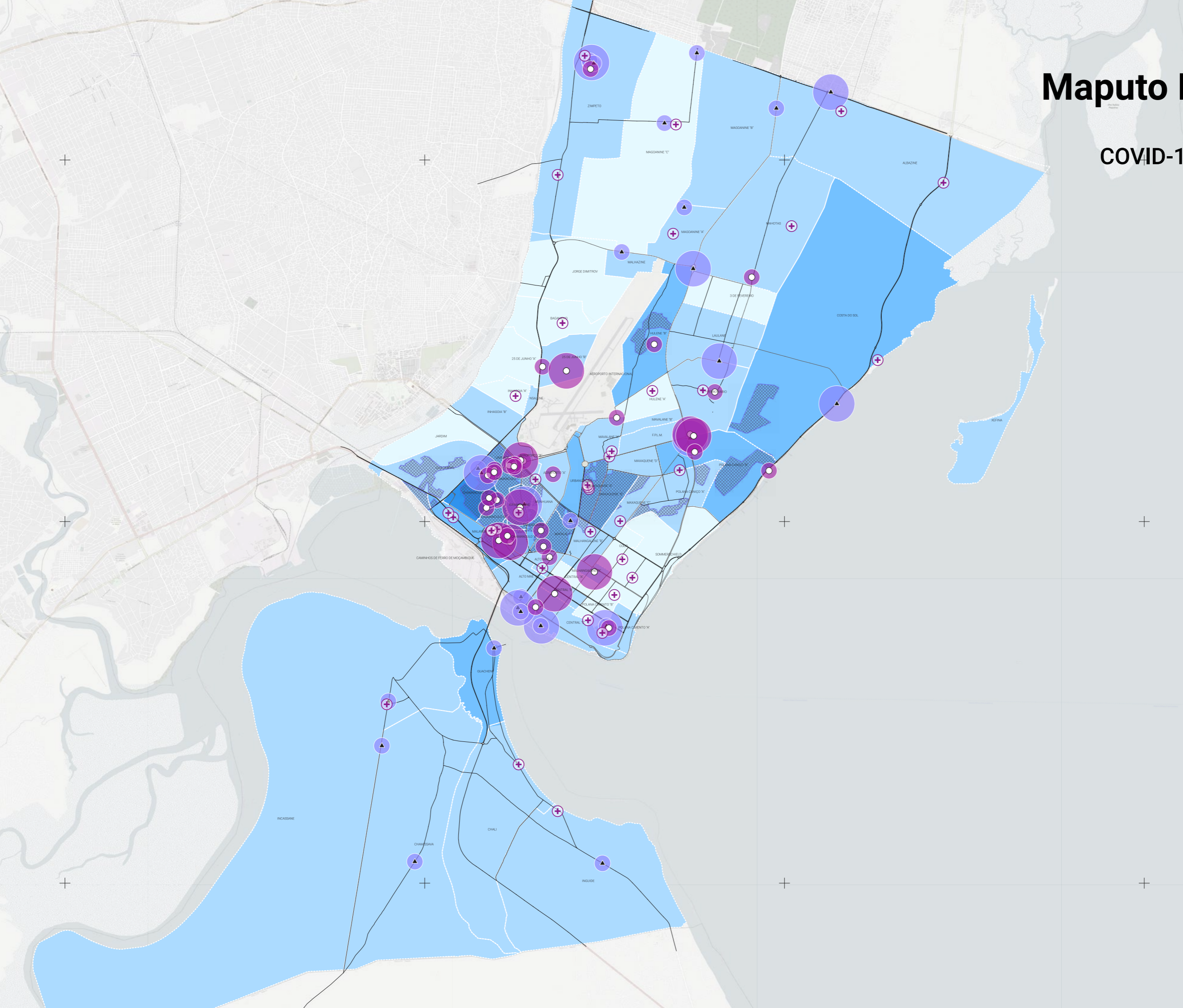
Despite better data than other municipalities in terms of access to water and sanitation, Maputo has a much higher population density, which increases the risk factors.

The map of Maputo City shows a very varied level of vulnerability, with a higher level in the more informal neighborhoods. The neighborhood with the highest vulnerability is Bairro de Chamanculo "C" in KaChamanculo District, which was also identified in the Sero-Epidemiological Survey of the City as the District with the highest number of COVID-19 cases. The markets and terminals identified as the most vulnerable are well distributed in the urban area with the highest concentration in KaChamanculo District. The Costa do Sol Neighborhood showed a medium-high level of vulnerability due also to the presence of beaches and public leisure spaces with larger crowds. The central neighborhoods of the "formal city" such as Sommerschild, Coop, Central and Polana Cimento have a low level of vulnerability, also due to good access to basic hygiene and sanitation services and information, among others.

-  **1,124,988** inhabitants
-  **3,589** inhab/Km² density
-  **83,8%** people with private access to water

Maputo Municipality

COVID-19 Vulnerability Map



LEGENDA

⊕ Unidades Sanitárias

★ Espaços Públicos

Mercados

○ Vulnerabilidade Baixa

● Vulnerabilidade Alta

Terminais

▲ Vulnerabilidade Baixa

▲ Vulnerabilidade Alta

Rede Viária

— Estradas Nacionais

— Primárias

— Secundárias

— Terciárias

▨ Assentamentos Informais

Níveis de Vulnerabilidade

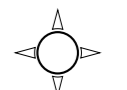
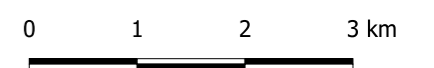
□ Baixo

□ Médio-Baixo

□ Médio

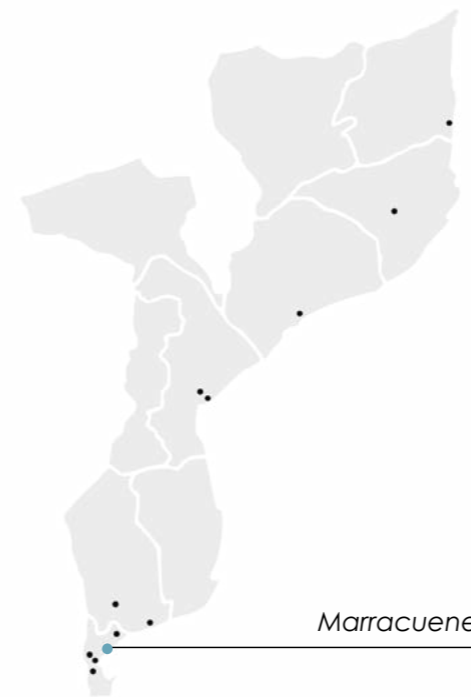
□ Médio-Alto

□ Alto





3.7 Marracuene District




According to the last INE census (2017), the population of Marracuene District, located in close proximity to Maputo Municipality and part of the Maputo Metropolitan Area, is 218,584 people, with an area of 700 km² and a population density of 310 inhabitants per Km².


The District of Marracuene is crossed by the National Road EN1 which is very frequented. The town presents some more urbanized central districts with a higher level of physical and socioeconomic development, concentrated around the main transport routes, and other rural and agricultural districts in the north with lower housing density, i.e. Taulae and Machubo. This distinction is also evident in the analysis of vulnerability, with the two neighborhoods mentioned above identified as the least vulnerable, while the central neighborhoods show a higher level of vulnerability. In particular, the southernmost localities, namely Michafutene and Vila-Sede, are the ones that presented Medium-High vulnerability level. This is due to the presence of localized informal settlements and to the concentration of the main services in this areas, such as transportation, professional and commercial services, markets and others that generate agglomeration of people.

The population of the District is also considerably dependent on public transport to travel to the other Municipalities in the Region, particularly Maputo and Matola, economic and service centers, thus creating conditions for greater exposure to COVID-19.

Although it is the only District subject of this research, Marracuene was considered a relevant case study being part of the Maputo Metropolitan Area. It is also important to note that the vulnerability mapping of Marracuene District was influenced by the inexistence of georeferenced information about the 7 localities in the District and the administrative division of neighborhoods distributed by localities, which were roughly estimated based on local knowledge. Even so, through the existing data sources it was possible to develop the spatial analysis of vulnerability to COVID-19.

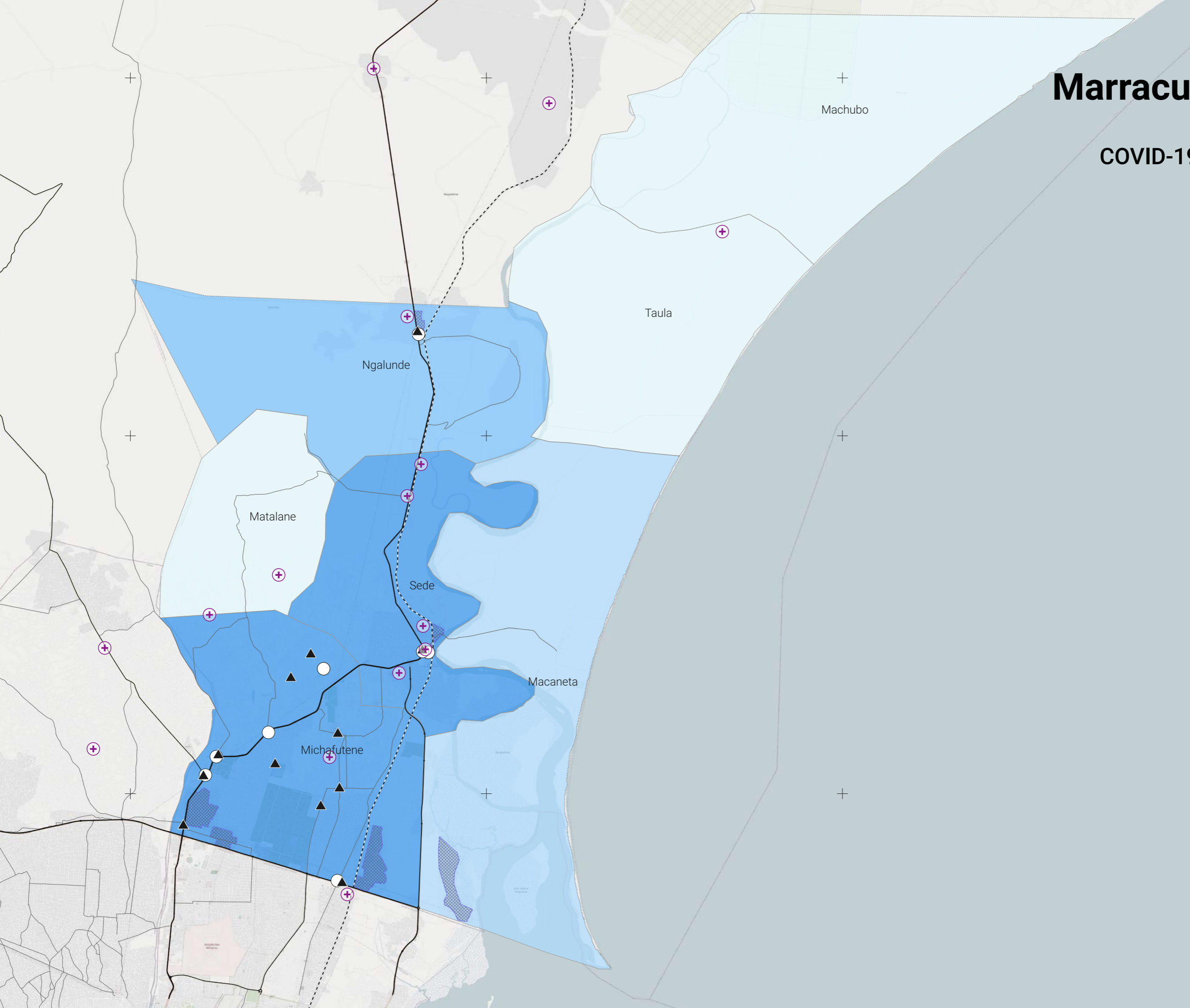
 **218,584**
inhabitants

 **700** inhab/Km²
density

 **76,1%** people with
private access
to water

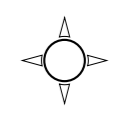
Marracuene District

COVID-19 Vulnerability Map



LEGENDA

- Unidades Sanitárias
- Mercados
- Rede Viárias**
 - Primárias
 - Secundárias
 - Terciárias
 - Pista Aeroporto
 - Aeroporto
 - Assentamentos Informais
- Níveis de vulnerabilidade 2**
 - Baixo
 - Médio-Baixo
 - Médio
 - Médio-Alto
 - Alto

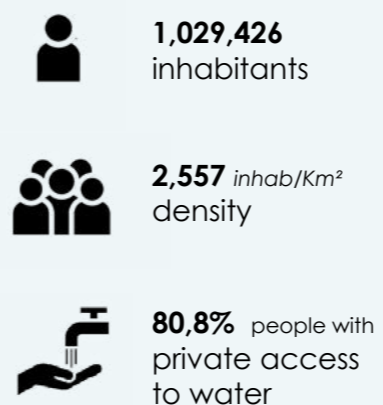




3.8 Matola Municipality



Matola Municipality, located in the Greater Maputo area, has 1,029,426 inhabitants, a surface area of 402km² and a population density of 2.557 inhabitants per Km². As one of the largest cities in the country, economic dynamism and the availability of building lands has generated urban growth in the city. The city also presents similar challenges to Maputo City in terms of rapid urban expansion. Consequently, the demand for space has led to the spread of settlements and infrastructure in riverine and coastal areas, which has also increased the exposure of local communities to threats such as floods and storm waves, thus exacerbating their vulnerability. Despite the rapid urbanization process and the relevant presence of informal settlements, most houses in Matola are conventional, with cement walls (77.5%) and floors (82.6%), and sheet or zinc roofs (86.9%). The houses in the city then present less precariousness, so it can be assumed that there is a certain level of structure to apply some prevention and protection measures such as quarantine. Households in Matola also have a good chance of maintaining adequate standards of hygiene to prevent COVID-19, due to quite high rates of access to not shared piped water inside the home (83.4%), similar to the country's capital city.

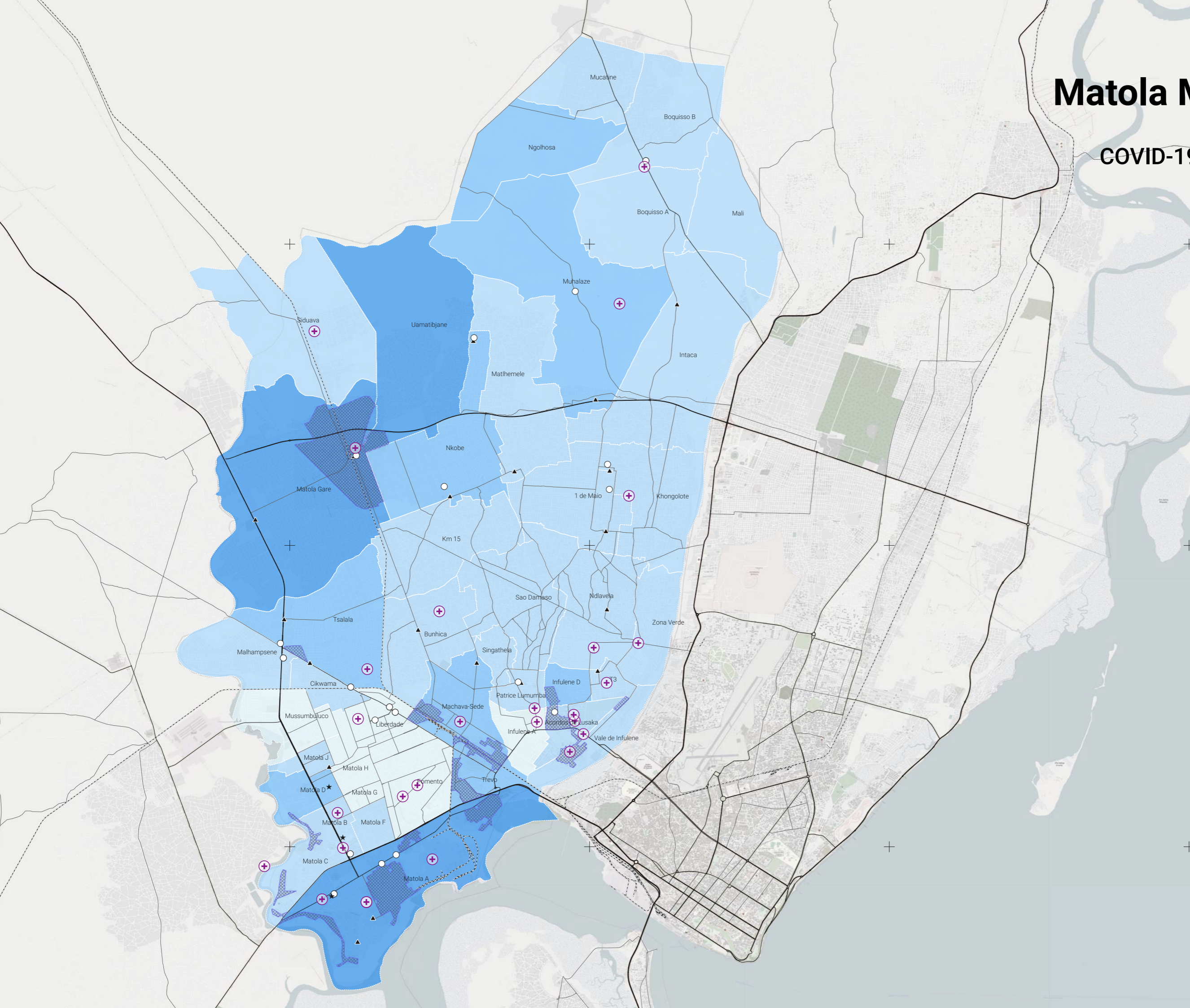


Due to these factors, the Municipality of Matola in general shows a very differentiated level of vulnerability to COVID-19 with a prevalence of medium-low vulnerability and some areas with a higher level, such as the neighborhoods of Matola Gare, Matola A and Uamatibjane. This is also a result of the higher population density in the southern areas of the city compared to the north and the greater presence of informal settlements.

Although the Municipality of Matola, along with Maputo, concentrates the commercial and social activities of the region as well as the territorial development of the area, there is still a strong dependence on public transport due to the high rate of commuters between Matola and Maputo who daily take crowded chapas with a high risk of contracting the disease. This is mainly due to the greater accessibility of housing in Matola compared to Maputo.

Matola Municipality

COVID-19 Vulnerability Map



LEGENDA

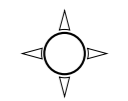
- Unidades Sanitarias
- Espaços Públicos
- Mercados
- Terminais
- Assentamentos Informais

Rede Viária

- Estradas Nacionais
- Vias Primárias
- Vias Secundárias
- Vias Terciárias
- Linha Férrea

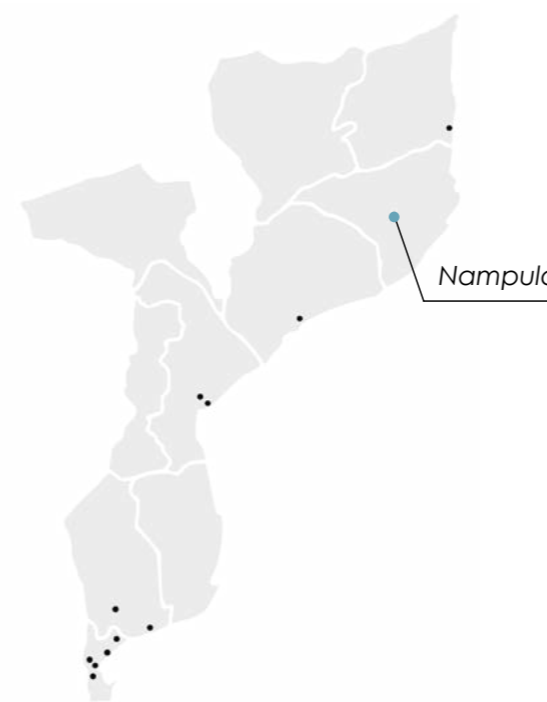
Níveis de Vulnerabilidade

- Baixo
- Médio-Baixo
- Médio
- Médio-Alto
- Alto








3.9 Nampula Municipality



Nampula Municipality has 756,963 inhabitants and a population density of 1.507 inhabitants per Km². The city has a high concentration of informal settlements in the urban center and most of the houses in Nampula are precarious in mixed or traditional material, inadequate to guarantee adequate isolation and social distancing in case of quarantine. The main challenges the city faces are reflected into the lack of coordination between the various institutions and sectors, such as water supply, sanitation, and housing, in the expansion of its services which creates problems of coverage of basic services. This deficit can bring challenges for the adequate prevention of COVID-19, since only 21% of families use safe water sources not shared with others. According to the 2020 Masterplan (PEU), there is also resistance to planning and land reorganization processes. This is given mainly by urban communities appropriating areas of public utility and by difficulties brought by the exiguity of spaces in the city for urban expansion.

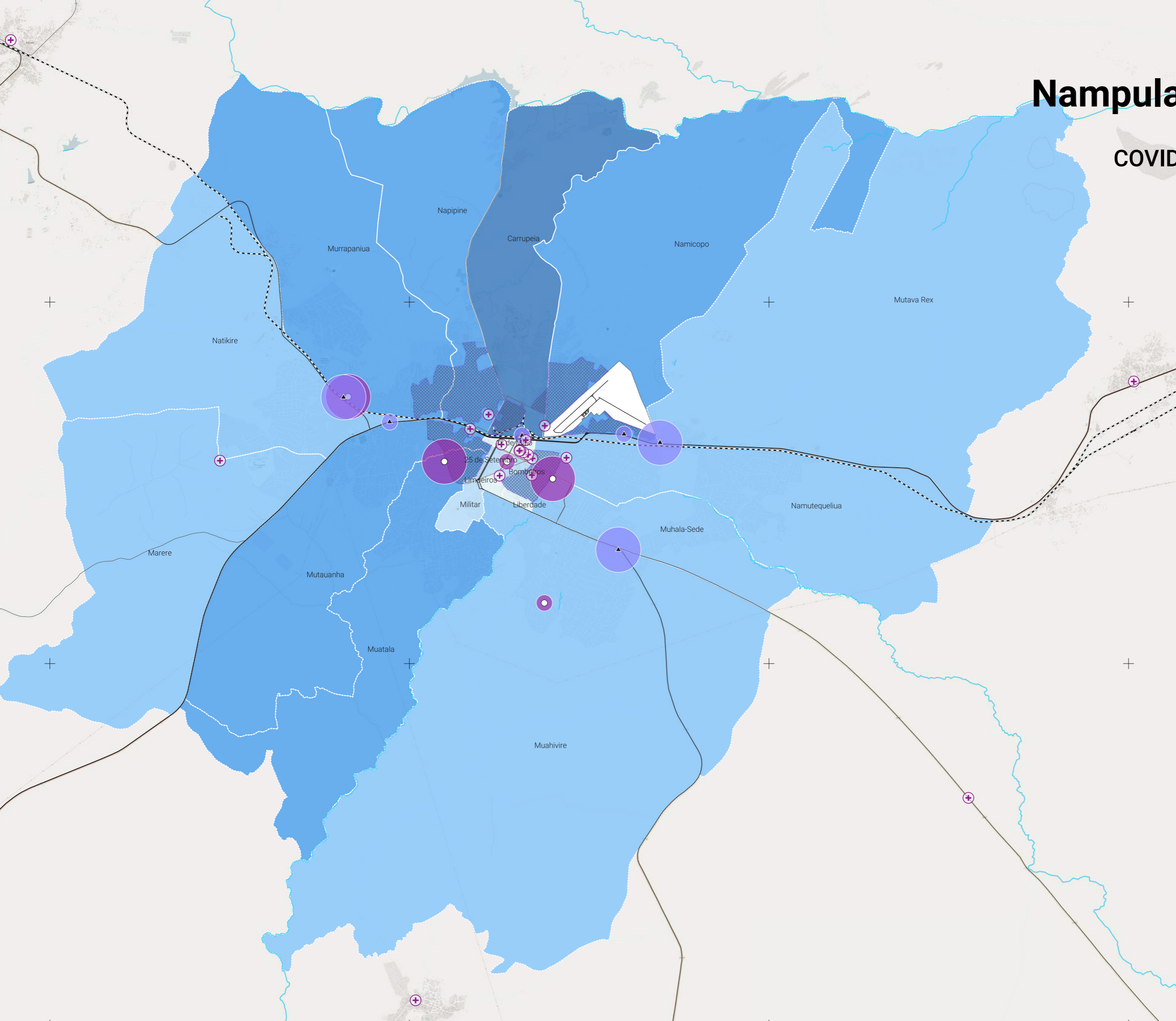
All these factors contribute to a disorderly urbanization with inadequate conditions of access to housing and water, hygiene and sanitation services, which increases the vulnerability of the population to COVID-19. This is reflected in the vulnerability mapping of Nampula Municipality, where evidence of the city's high vulnerability to COVID-19 emerged. No neighborhoods registered a low level of vulnerability and seven neighborhoods, covering almost 40% of the Municipality's area, have a Medium-High or High level of vulnerability. The city center and the Carrupeia neighborhood were identified as the most vulnerable places.

On the other hand, the city presents a certain level of overcrowding at the level of services such as markets and public transportation, whether formal or informal, thus generating an occasion to spread the virus. The public transportation offer consists mostly of minibuses, which presents a risk in terms of COVID-19, added by the fact that, as in many other Municipalities, most stops have no infrastructures or facilities to wash hands before entering the transport. The motorbike-taxi service is essential to complement the city's urban mobility, thus bringing its challenges since passengers have direct physical contact with the driver.

- 
756,963 inhabitants
- 
1,507 inhab/Km² density
- 
21% people with private access to water

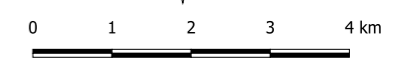
Nampula Municipality

COVID-19 Vulnerability Map



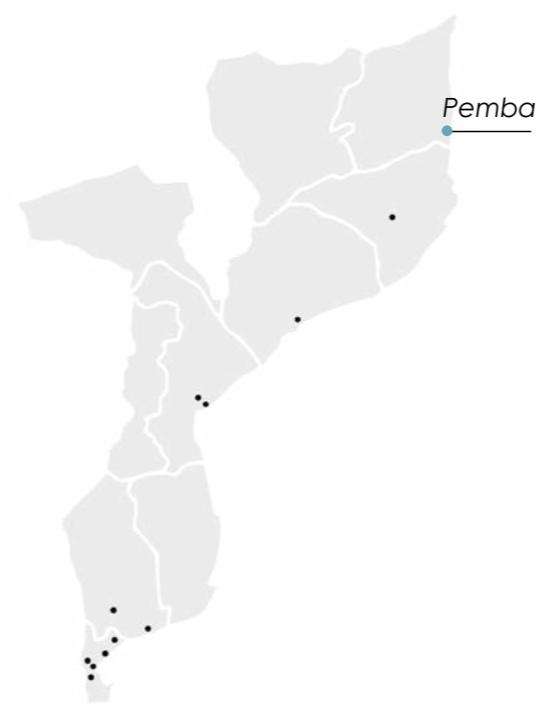
LEGENDA

- ⊕ Unidades Sanitárias
- ★ Espaços Públicos
- Terminais**
 - ▲ Vulnerabilidade Baixa
 - ▲ Vulnerabilidade Alta
- Mercados**
 - Vulnerabilidade Baixa
 - Vulnerabilidade Alta
- ▨ Assentamentos Informais
- Rios
- Pista Aeroporto
- ▭ Aeroporto
- Rede Viária**
 - Estrada Nacional
 - Primária
 - Secundária
 - Terciária
 - - - Linha Férrea
- Níveis de vulnerabilidade**
 - Baixo
 - Médio-Baixo
 - Médio
 - Médio-Alto
 - Alto








3.10 Pemba Municipality



Pemba Municipality has 199,977 inhabitants and a population density of 1.960 inhabitants per km², with a very rapid growth record in recent years. The Municipality has also been facing since October 2020 a large influx of internally displaced people due to the conflicts present in the region, thus generating several challenges. Among these, the guarantee to all of access to basic services and the overcrowding of the existing urban settlements that already had a high population density rate. In this way, the vulnerability to COVID-19 of the population of Pemba as well as the IDPs is increasing exponentially, with the latter seeking shelter in houses where there were already a considerable number of people, favoring agglomerations.

The city growth with an absence of previous planning actions brings various consequences. Among these, a deficient mobility and accessibility structure, the absence of reserve areas for public utility equipments, the non-provision of efficient infrastructures, nor a clear organization of the housing plots with the consequent difficulties in the organization of the municipal cadastral. All these elements bring to a disorderly urbanization and a lack of access to basic services, which make it difficult to apply the basic measures for the prevention of COVID-19. This condition is also exacerbated by the fact that, despite Pemba being the capital of Cabo Delgado Province, the majority of houses of the city are precarious and placed in overcrowded informal settlements, with walls of wood (79%), roofing of grass or palm trees (95.5%) and adobe floors (67.2%).

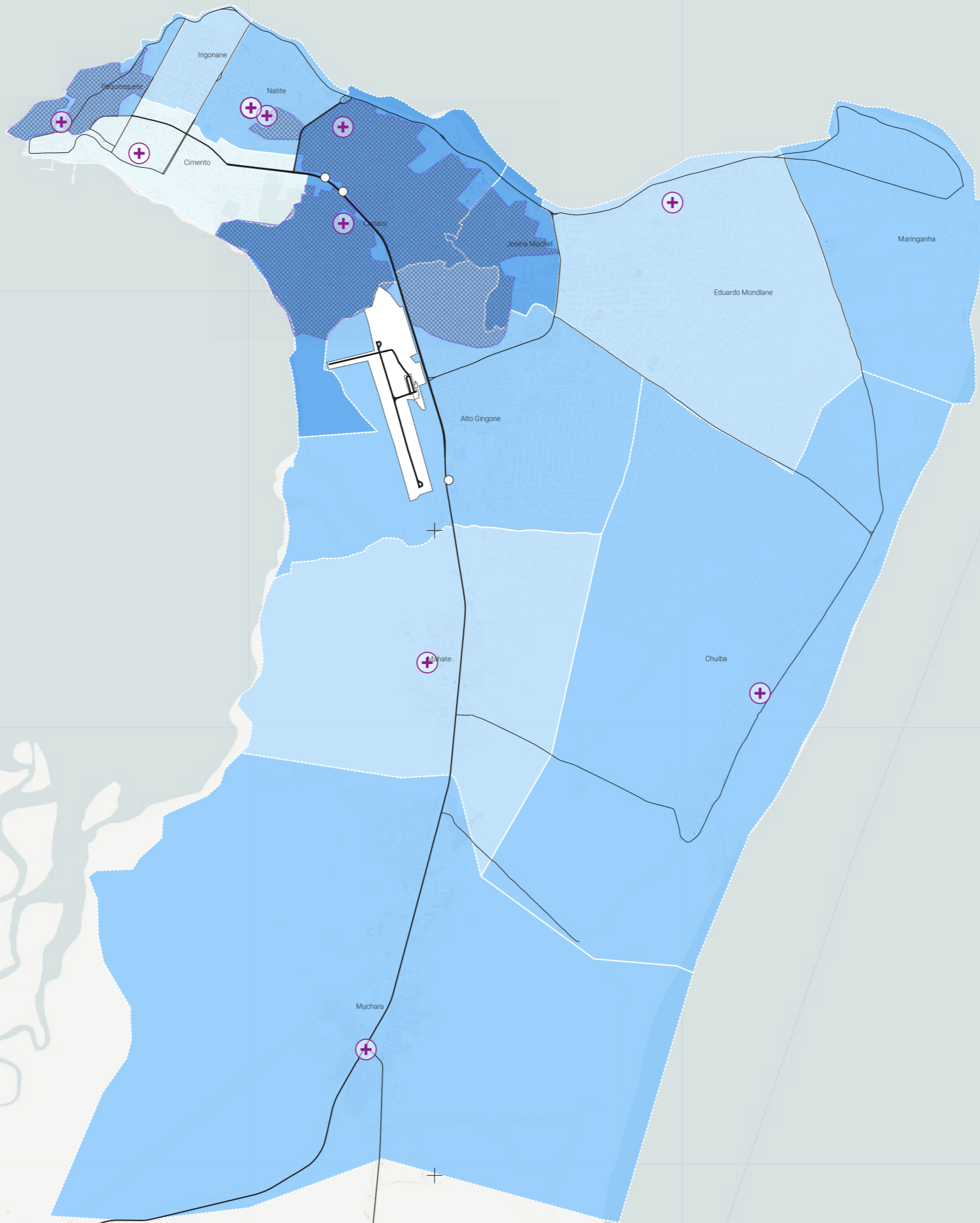
- 
199,977 inhabitants
- 
1,960 inhab/Km² density
- 
42% people with private access to water

Consequently, the map of Pemba Municipality shows that the general level of vulnerability to COVID-19 is medium-high. In particular, the Josina Machel and Cariocó neighborhoods, more populated, revealed a high level of vulnerability and have extensive areas of informal settlements, which also showed, according to the Sero-Epidemiological Survey, a high rate of COVID-19 contraction.

There is only one neighborhood located in the central area of the city, Bairro Cimento, with a low level of vulnerability, due to its higher formality rate and access to basic services. Some risk locations, such as markets, also lack the necessary hygienic structures.

Pemba Municipality

COVID-19 Vulnerability Map



LEGENDA

Unidades Sanitárias

Mercados

Rede Viárias

Primárias

Secundárias

Terciárias

Pista Aeroporto

Aeroporto

Assentamentos Informais

Níveis de vulnerabilidade 2

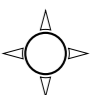
Baixo

Médio-Baixo

Médio

Médio-Alto

Alto



0 0.75 1.5 2.25 km






3.11 Quelimane Municipality




The Quelimane Municipality has 346,820 inhabitants, a surface area of 122 km² and a population density of 2.875 inhabitants per km². Quelimane is a coastal city and the fourth largest city in the country. One of the biggest challenges of the city, as presented in the Masterplan (PEU) of 2020 is the lack of spatial organization as a whole. This means that there are land conflicts, occupation of areas at risk and in a disorderly manner, which translates into the formation of informal settlements. Here, besides the precariousness of housing (more than 60% of the houses in the city have walls made of sticks and reeds, bamboo and palm trees), there is a combination of lack of access to basic services such as water and sanitation.

This is reflected in the context of the COVID-19 pandemic, with the Municipality of Quelimane resulting as a city with medium-high vulnerability. The most critical points reflected in the map, are the neighborhoods with the highest rate of informality, such as Icidua, Bairro Novo, Manhaua, Brandão and Janeiro. Still, most of the markets identified as high-risk areas are located in more central and more frequented neighborhoods.

 **346,820** inhabitants

 **2,875** inhab/Km² density

 **26,4%** people with private access to water

One of the great vulnerabilities of the Municipality is given by the access to water. There are supply restrictions in some neighborhoods due to low reservoir capacity, a difficulty in expanding the potable water supply network in some neighborhoods, and some wells lacking conventional system without prior treatment. According to the INE census only 26.4% of residents have private access to water and 30% of people have no access to safe water. This issue increases the vulnerability to communicable diseases among which COVID-19 particularly of the residents of the city's informal settlements. This also combined with the high population density and lack of planning to allow equitable access to basic services in these same neighborhoods, as well as insufficient sanitation facilities at the community level.

On the other hand, the city of Quelimane has the highest rate of bicycles per inhabitant in the country, with 45.1% owning a bicycle. Bicycles are the most used means of public transport in the city with around 5,500 taxi-bicycles in addition to taxi-motorbikes among others. These means of transport make the prevention of COVID-19 even more difficult due to the greater likelihood of personal contact between passenger and driver, which can be an additional risk factor.

Quelimane Municipality

COVID-19 Vulnerability Map

LEGENDA

⊕ Unidade Sanitária

★ Espaços Públicos

Terminais

▲ Vulnerabilidade Baixa

▲ Vulnerabilidade Alta

Mercados

○ Vulnerabilidade Baixa

○ Vulnerabilidade Alta

▨ Assentamentos Informais

Rede Viárias

— Vias Primárias

— Vias Secundárias

— Vias terciárias

Níveis de Vulnerabilidade

□ Baixo

□ Médio-Baixo

□ Médio

□ Médio-Alto

□ Alto

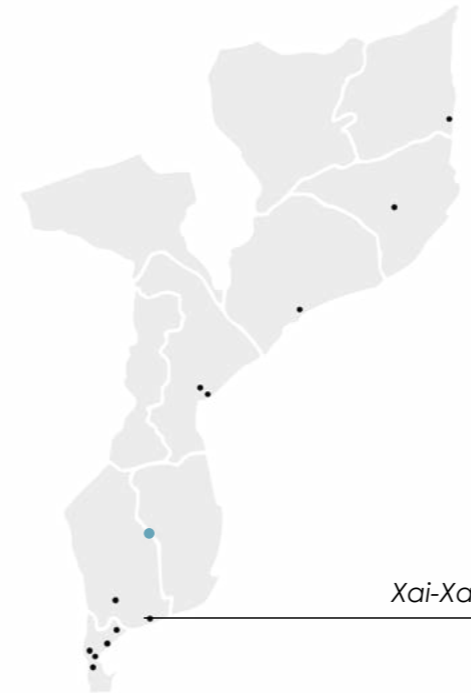


0 1 2 3 km





3.12 Xai-Xai Municipality




The Xai-Xai Municipality, capital of the southern Gaza Province, has 141,525 inhabitants, a surface area of 135 km², and a population density of 1.048 inhabitants per Km². The City of Xai-Xai has two different areas, the high and the low one, this last in the central western part of the city. The municipality has some informal settlements located mainly in the central part of the city and in the “high” zone, and also has vast peri-urban areas, predominantly agricultural, that are particularly exposed to floods. The distribution of the population by neighborhood is uneven; the most populated neighborhoods with the highest concentration of people are those located in the “high area” which received the families affected by the floods of recent years. According to the INE census (2017), 50.8% of the houses are inadequate, built with local precarious material, made of reeds, sticks, bamboo or palm trees, concentrated in the most populated neighborhoods of the “high area”, which shows a certain housing precariousness.

Despite the challenges that still exist in the most densely populated neighborhoods and informal settlements, especially in terms of social distance and adequate hygiene standards, the Municipality of Xai-Xai is generally less vulnerable than others in terms of access to water and hygiene.


In terms of access to safe water, that is an essential point to prevent COVID-19, 57% of the dwellings in Xai-Xai have access to piped water in or around the backyard. (INE 2017)

This is a relatively high proportion compared to the reality of the other municipalities and allows easy access to preventive measures such as hand washing. Despite not satisfactorily covering all the Administrative Posts, the network of boreholes and wells supplies most of the population throughout the year.

The vulnerability mapping of the Xai-Xai Municipality indicates a relatively homogeneous distribution throughout the city, with prevalence of medium vulnerability conditions. The neighborhoods considered most vulnerable are the most densely populated in the “high” zone such as the Bairro Comunal A and the neighborhoods in the “low” zone such as the 2° and 3° Bairro Comunal. Some particularly risky locations for COVID-19 transmission, such as markets, present a great challenge in Xai-Xai, since according to the Masterplan of the Municipality, the markets have poor hygiene and sanitation conditions, thus making it impossible to apply adequate hygiene measures. This is also reflected in the local Sero-epidemiological survey, with market vendors being the professional category with the highest rate of positivity (5.9%).

 **141,525**
inhabitants

 **1,048** inhab/Km²
density

 **73,1%** people with
private access
to water

Xai-Xai Municipality

COVID-19 Vulnerability Map

LEGENDA

⊕ Unidades Sanitárias

★ Espaços Públicos

Terminais

▲ Vulnerabilidade Baixa

▲ Vulnerabilidade Alta

Mercados

○ Vulnerabilidade Baixa

○ Vulnerabilidade Alta

▨ Assentamentos Informais

— Rios

Rede Viária

— Estrada Nacional

— Vias Primárias

— Vias Secundárias

— Vias Terciárias

Níveis de Vulnerabilidade

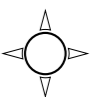
□ Baixo

□ Médio-Baixo

□ Médio

□ Médio-Alto

□ Alto



0 1 2 3 km





4. PRIORITY ACTION MATRIX

After identifying the most vulnerable locations to COVID-19 in the 12 case studies through the maps, Action Plans were also developed with a participatory approach. The purpose of the plans is to allow each municipality to identify, on the basis of the prioritization of sites already carried out, the most urgent and relevant actions to be implemented for COVID-19 prevention and response.

Each Municipality through its Focal Point, identified between 4 and 6 priority actions with a tool made for this purpose to guide them in the prioritization process. The Priority Actions are divided into three different thematic pillars:

- **Institutional coordination and planning**
- **Water, Sanitation, Hygiene and Urban Planning**
- **Community Awareness and Engagement**

For each Priority Action, the Municipalities have identified key activities to be carried out, time frame, budget and responsible parties to carry them out.

The results were collected in the Matrix reproduced in the following page, in order to compare the Municipalities to understand the most urgent actions to be undertaken in urban areas.

In the following matrix, the priority actions were listed by each pillar from the most selected to the least selected by the municipalities.

In general, we can observe that Pillar 2 and 3, the most operational, were the most prioritized. Among these, the highest priorities in terms of planning and WASH were given to the spatial reorganization of markets and the adequacy of facilities and infrastructures to ensure access to water and hygiene for users and sellers.

At the same time, a greater urgency has been given for intervention in the public spaces compared to strengthening of hygiene measures in human settlements.

Awareness raising activities were considered as a very high priority by all Municipalities, with prevalence for activities carried out through local leaders and activists for community mobilization, in the most vulnerable settlements.

Priority Actions Matrix for COVID-19

Prevention and Response at Municipal level

Priority Action

I. I. INSTITUTIONAL COORDINATION AND PLANNING

AP1: Identify the areas of the city and the people most at risk to COVID-19

AP2: Comprehensively and effectively plan the actions to prevent and respond to COVID-19 in the city

AP3: Create an effective coordination mechanism within the municipality, with the central government and with relevant partners in the pandemic context

II. WATER, SANITATION, HYGIENE AND URBAN PLANNING

AP4: Reorganize markets from a spatial point of view to ensure social distancing and proper management of people flows for COVID-19 prevention

AP5: Equip markets with a system of access to water, sanitation and hygiene to prevent COVID-19

AP6: Promote access to water, sanitation and hygiene in vulnerable communities and neighborhoods, with a focus on informal settlements

AP7: Promote continuous citizen access to hygiene in public spaces and places of greater concentration, through handwashing points with a mechanism for management, operation and sustainability

AP8: Improve protection of the Municipal staff and citizens to COVID-19 through appropriate equipment for protection, disinfection, hygiene and cleaning of specific places

III. COMMUNITY AWARENESS AND ENGAGEMENT

AP9: Disseminate periodic and effective information to the population to raise awareness on COVID-19 through community mobilization and engagement

AP10: Disseminate periodic and effective information to the population to raise awareness on COVID-19 through awareness materialw

Beira Boane Chokwe Dondo Manhiça Marracuene Matola Nampula Quelimane Xai-Xai



5.RECOMMENDATIONS

Based on the results of this participatory exercise with the Municipalities of Mozambique, some general recommendations were developed to decrease the vulnerability of the urban population and spaces to COVID-19, considering also that the pandemic can be an opportunity to rethink and better plan the cities.

- 1. Design and plan better the most frequented public spaces such as markets and public transport terminals to decrease vulnerability to COVID-19 and other communicable diseases and promote access to water and hygiene**
- 2. Promote the use of participatory and innovative tools to engage local authorities in strategic planning for reducing the vulnerability of the urban population**
- 3. Ensure the improvement of infrastructures, housing and basic services in informal settlements to promote access to water, sanitation and hygiene and adequate housing conditions**
- 4. Strengthen the potential of schools as a hub for production and dissemination of good practices in the fight to the pandemic**



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